

# **U.S. Federal Meteorological Data Management Handbook:**

## **A Guide To Standards And Best Practices**

**FCM-H13-2020**

Interdepartmental Committee for Meteorological Services  
and Supporting Research (ICMSSR)

Committee for Operational Processing Centers (COPC)  
Working Group for Cooperative Support and Backup (WG/CSAB)

Working Group for Observational Data (WG/OD)

# **U.S. FEDERAL METEOROLOGICAL DATA MANAGEMENT HANDBOOK:**

## **A GUIDE TO STANDARDS AND BEST PRACTICES**

[Office of the Federal Coordinator for  
Meteorological Services and Supporting Research](#)

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## FOREWORD

Across the Federal Weather Enterprise (FWE),<sup>1</sup> Federal agencies follow generally accepted and/or agency-specified data management procedures for reporting meteorological observations and for using such data reports in numerical weather prediction (NWP) models and other data-dependent activities. Another major source of data management requirements and specifications is the World Meteorological Organization (WMO). This guide is not intended as either a compilation or alternative source of such data management procedures and practices.

The purpose of this guide is to address specific issues or information needs in collaborative reporting and use of meteorological data that have been deliberated and acted upon by the Working Group for Observational Data (WG/OD). The guide is organized into discrete parts in order to address solutions to specific issues in sharing and using observational data. Each part deals with one issue or information need on which the WG/OD has been called upon to provide guidance. Because these solutions are necessarily embedded within the general procedures and WMO regulations that FWE partner agencies follow, the guidance provided here makes frequent references to other documents and information sources. In short, the guide is intended to fill some important gaps that, if left unresolved, would reduce the effectiveness and efficiency of collaborative production and use of meteorological observations across the FWE and all the diverse user communities we serve.

The WG/OD works under the Committee for Operational Processing Centers (COPC), part of the interdepartmental coordination structure supported and managed through the Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM). The interagency body that oversees and approves this entire coordination structure, including COPC and its WG/OD, is the Federal Committee for Meteorological Services and Supporting Research (FCMSSR).<sup>2</sup>

On behalf of OFCM, the National Oceanic and Atmospheric Administration under which OFCM works, and our user communities across the Nation, I thank the members of the Working Group for Observational Data, each of whom represents one of the entities contributing to the Federal Weather Enterprise, for the several years of work that have gone into this guide.

Michael F. Bonadonna  
Federal Coordinator for Meteorological Services  
and Supporting Research

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<sup>1</sup> The term *Federal Weather Enterprise* is defined in *Strategic Plan for Federal Weather Enterprise Coordination*, FCM-P1-2017, available on the [OFCM Plans webpage](#).

<sup>2</sup> For further information on the Federal Weather Enterprise and the coordinating infrastructure supported by OFCM and overseen by the FCMSSR, consult the OFCM website at [www.ofcm.gov](http://www.ofcm.gov).



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## EXECUTIVE SUMMARY

As explained in the Foreword, the purpose of this guide is to report on solutions to specific issues and information needs in sharing and using meteorological observations across the Federal Weather Enterprise (FWE). At the time of this initial release, the Working Group for Observational Data (WG/OD) has investigated and decided upon guidance in two areas.

Part 1 addresses the issue of how Federal agencies are implementing the assignment of unique identifiers for non-satellite-based observing stations in accordance with regulations promulgated by the World Meteorological Organization (WMO) for the WMO Integrated Global Observing System (WIGOS). Prior to 1 July 2016, the WMO Secretariat assigned unique identifiers for land-based observing stations that reported observations as part of WMO programs, such as the World Weather Watch. Similarly, marine observing platforms and other types of surface-based observing platforms and stations were given identifiers by other international bodies. Under WIGOS, the assignment of a unique identifier to new stations (stations that did not report to a WMO program prior to 1 July 2016) is now the responsibility of the WMO Member nation with jurisdiction for the new station. In short, assignment of identifiers has been decentralized and distributed to the WMO Members.

Part 1 explains the four segments that constitute a complete WIGOS Station Identifier (WSI), how those segments are assigned for stations that were reporting through WMO programs prior to 1 July 2016 (here called “legacy IDs”), and how the segments shall be assigned for new stations. Examples are included to illustrate how these assignments are made for different types of observing stations/platform (e.g., land-based surface observations, upper-air radiosonde observations, stationary ocean-based or coastal stations, and mobile marine platforms) and in different circumstances.

In this guide, a *dual-location station* is a fixed-location, land-based observing station for which the same unique identifier has been used by both a surface synoptic observing site and a rawinsonde (upper air observing) site that are not at the same physical location (not co-located). Part 2 addresses the question of when these two locations should continue to use the same identifier and when each location should report data with its own unique identifier. The dual-location issue initially came before the WG/OD prior to operational use of WSIs (the subject of Part 1), but the guidance decided upon by the WG/OD is presented here in terms of WSI assignments and therefore employs and builds upon the guidance in Part 1. As in Part 1, examples are included to illustrate the general rules specified by the WG/OD.

Future releases of this guide will have additional parts, to address new issues and provide supplemental guidance decided by the WG/OD, as well as providing updates to the guidance on WSI assignment (Part 1) and dual-location stations (Part 2).



# INTRODUCTION

## Role of the Working Group for Observational Data

This guide is produced and maintained by the Working Group for Observational Data (WG/OD), under the auspices of the Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM) and the Interdepartmental Committee for Meteorological Services and Supporting Research (ICMSSR), to provide guidance on requirements and recommendations applicable to Federal agencies involved in managing observational data. In the context of this document, “observational data” can include meteorological, oceanographic, and other environmental observations, including the metadata describing and characterizing such observational data. In particular, the data management procedures and practices documented here are essential to ensuring timely, accurate, and effective communication of observational data to the U.S. national Operational Processing Centers (OPCs), the Global Telecommunication System (GTS) of the World Meteorological Organization (WMO) Information System (WIS), and other related data centers.

The guide is intended as a “living document” that will expand and be revised as the WG/OD or other working groups of the Committee for Operational Processing Centers (COPC) address and resolve issues with coordinating observational data communications in any of the areas under their purview. To this end, the guide is structured as a series of parts. Each part presents guidance on a specific data management issue or information need.

## Language Conventions

Throughout this document, the following language conventions are used to distinguish among requirements (mandatory standards), recommendations (best practices), and descriptive statements.

### Use of “Shall” and “Must”

Use of “shall” or “must” in a statement in this document always means that a requirement or mandatory standard is being stated.

For example, practices and procedures that WMO Member nations are required to follow or implement are stated using *shall* language. The WMO Technical Regulations refer to such practices and procedures as *standard practices and procedures*.<sup>3</sup> Another example would be statements of a Federal agency’s requirements for adhering to a mandatory practice for that agency’s staff and/or others formally involved with that Agency.

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<sup>3</sup> See World Meteorological Organization, [Manual on the WMO Integrated Global Observing System: Annex VIII to the WMO Technical Regulations, WMO-No 1160](#), p. xi.

“Shall” language is also used for requirements developed by the WG/OD and approved through the OFCM coordinating structure up to the ICMSSR level.

When “shall” language is used, either explicit reference or context will specify the organization that has mandated the requirement.

### ***Use of “Should”***

Uses of “should” in this document indicate a recommendation or “best practice.” These may be statements of WMO *recommended practices and procedures* or WG/OD suggested best practices. In either case, recommendations and best practices are not mandatory requirements.

### ***Uses of “Will”***

The use of “will” in the predicate of a statement indicates a description of a current matter of fact or of a condition that the WG/OD expects will happen.

## **Abbreviations and Acronyms**

General Appendix A, included at the back of this guide, lists the abbreviations and acronyms used in any of the Parts of the guide.

**PART 1**  
**WIGOS STATION IDENTIFIERS**



## 1.0 The WMO Integrated Global Observing System

According to the World Meteorological Organization (WMO), “the WMO Information System (WIS) acts as a one-stop shop for all activities related to data management. Users with access privileges can easily find and retrieve all the weather, climate and water data and products they need in one place...Authorized users can gain immediate access to data without waiting for requests to be routed through various GTS [Global Telecommunications System] hubs before the data can be delivered. Furthermore, they can easily modify their data subscription and maintain their discovery metadata as needed.”<sup>4</sup> Within the WIS strategy, the WMO Integrated Global Observing System (WIGOS) will provide the “framework for all WMO observing systems and for WMO contributions to co-sponsored observing systems in support of all WMO Programmes and activities.”<sup>5</sup> A significant change from the legacy GTS to the new WIGOS infrastructure is the use of a four-component unique identifier for observing stations/platforms (other than satellites), called the *WIGOS station identifier* (WSI).

Two key WMO documents for WIGOS specifications, frequently cited in this guidance, are the current editions of the [Manual on the WMO Integrated Global Observing System: Annex VIII to the WMO Technical Regulations](#), WMO-No 1160 (hereafter, “*WIGOS Manual*”), and the [Guide to the WMO Integrated Global Observing System](#), WMO-No 1165 (hereafter, “*Guide to WIGOS*”). These and other relevant WMO documents are listed in the annotated bibliography included as Appendix 1.A at the end of Part 1.

The Seventeenth World Meteorological Congress decided to proceed with the preoperational phase of WIGOS starting on 1 July 2016. Resolution 37 of the Eighteenth World Meteorological Congress approved starting the transition to an operational WIGOS. The Initial Operational Period started on 1 January 2020 and continues through December 2023. Proposed milestones for this period include having all software of entities using the GTS able to send and/or receive and process observational data reports that use only WSIs by the end of December 2023.<sup>6</sup> After that time, observing station data communicated via the WIS-GTS must use WSIs in messages coded in BUFR (Binary Universal Form for the Representation of meteorological data). Coding specifications for the four-segment WSI (WSI segments are explained in Section 1.1 below) can be found in the WMO documentation for BUFR.<sup>7</sup>

Before 1 July 2016, observing stations/platforms (including land-based stations, marine fixed and mobile platforms, aircraft, etc.) that participated in a WMO program, such as the World Weather Watch, Global Atmosphere Watch, WMO Satellite Programme, or WMO Weather Radar, were

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<sup>4</sup> Adapted from the webpage “[WMO Information System \(WIS\)](#).”

<sup>5</sup> *WIGOS Manual*, Section 1.1.1.

<sup>6</sup> The WG/OD notes that this proposed deadline for being able to send and receive reports that use only WSIs is still tentative and subject to delay as WMO member nations work to implement the new WIGOS infrastructure.

<sup>7</sup> The official WMO manual on BUFR is the most recent update of the [Manual on Codes: International Codes, Volume 1.2, WMO No. 306](#). Section 2.2, “WIGOS-ID-BUFR,” of the *Guide to WIGOS* gives specific guidance on representing WSIs in standard code forms, including BUFR. You can also download the latest versions of [Table B](#) and [Table D](#) as Microsoft Word documents.

assigned WMO-sanctioned unique identifiers (IDs). These IDs, along with observing-platform identifiers assigned by certain other international organizations, are generally retained as the fourth segment of the station's WSI, as explained in Section 1.2.

**Definition of *legacy ID*.** For purposes of this guide, a WMO-sanctioned ID allocated to an observing station/platform prior to 1 July 2016 is called a *legacy ID*. A station/platform identifier that was in use prior to 1 July 2016 but not a WMO-sanctioned ID is called a *prior non-WMO ID*.

As noted above, by the end of the WIGOS Initial Operating Period (currently, 31 December 2023), WSIs will be required for communicating observational data via WIS-GTS. In the interim, either the previously used station/platform identifier (that is, either legacy IDs or prior non-WMO IDs) or the WSI, or both types of identifier, can be used within the same observational message exchanged on the GTS. WMO has stated that member nations shall issue advanced notification at least 3 months prior to the start of GTS data distribution of BUFR reports that include WSIs as well as the legacy ID or prior non-WMO ID. Appendix 1.B contains the WMO guidelines on interim use of WSIs and advance notification prior to including them in BUFR reports on the GTS.<sup>8</sup>

The WMO requirements to assign and use WSIs only apply to observing stations/platforms that are reporting observational data on WIS-GTS after WIGOS is declared fully operational. WSIs are not required to be assigned to stations that cease reporting before that date, and historical archives, databases, etc., of observing data will continue to use the observing station/platform IDs (whether legacy IDs or prior non-WMO IDs) in use when the data were reported.

## 1.1 WSI Structure and Segment Coding Conventions

A complete WSI consists of four segments (or components):<sup>9</sup>

WIGOS Identifier Series (numeric)	Issuer of Identifier (numeric)	Issue Number (numeric)	Local Identifier (alphanumeric)
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**Segment 1:** The *WIGOS Identifier Series* is a number defined by the WMO. The initial *permitted* range for this component is 0–14. To date, the only value defined is 0 (zero). Therefore, currently all WSIs have 0 as their WIGOS Identifier Series segment.<sup>10</sup>

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<sup>8</sup> The 30 October 2017 Circular Letter from the WMO Secretary-General is also available online [here](#).

<sup>9</sup> See *Guide to WIGOS*, pp. 5-6. In this document, the term “segment” is used to refer to a component of a WSI because in the WMO literature, and in the OSCAR/Surface database, complete WSIs are typically shown as a long character string with the four components separated by dashes. Also, WMO uses the term “component” in a number of other senses, such as “components of a WMO program” or “components of an observing platform.” Furthermore, in WMO literature, the terms “block” and “part” are also sometimes used to refer to WSI components. In the BUFR code form, the character-string representation with WSI segments separated by dashes (hyphens) does not occur. Instead, there is a BUFR field for each of the WSI’s four segments (or components).

<sup>10</sup> Ranges for WSI segments are specified in *WIGOS Manual*, Attachment 2.1.

**Segment 2:** The *Issuer of Identifier* is a numeric value designating the entity responsible for issuing the WSI. As documented in Table 2.1 of the *Guide to WIGOS*, numeric ranges are reserved for WMO-specified categories of issuer.

- The range 20000–21999 is reserved for use of the WMO Secretariat for WSIs associated with WMO programs. These are programs that either issued WMO-sanctioned station IDs to observing stations/platforms prior to 1 July 2016 (i.e., stations and platforms with legacy IDs) or choose to issue a WSI for a new station or platform after that date.<sup>11</sup> Table 2.2 in the *Guide to WIGOS* lists Issuer of Identifier values assigned to specific WMO-sanctioned programs for the legacy IDs recognized by that program.
- The range 1–9999 is reserved for WMO member states and territories that have an ISO 3166-1 three-digit numeric country code. The ISO 3166-1 three-digit code for the United States is 840.<sup>12</sup>
- The range 10000–11999 is reserved for member states and territories that do not have an ISO 3166-1 numeric country code.
- The range 22000–39999 is reserved for use of the WMO Secretariat in specifying WSIs associated with the programs of partner organizations. In the past, one such partner organization was the WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM), which sanctioned identifiers for marine platforms.<sup>13</sup> The WMO Secretariat has assigned these JCOMM legacy IDs the Issuer of Identifier sequence 22000. Examples of WSIs based on JCOMM legacy IDs are included in Sections 1.2.2 and 1.3.2.

Consult Tables 2.1 and 2.2 of the *Guide to WIGOS* for additional details on the allocated ranges for the Issuer of Identifier segment.

**Segment 3:** The *Issue Number* is a numeric value controlled by the Issuer of Identifier (i.e., the WMO program, WMO Member, or WMO-recognized partner organization corresponding to the Issuer of Identifier value in the WSI). It can be used to categorize observing stations/platforms in a way that is useful to that Issuer. For WIGOS Identifier Series = 0, the permitted range of the Issue Number component is 0–65534.<sup>14</sup>

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<sup>11</sup> A general principle of the WIGOS infrastructure is that after 1 July 2016, WMO Members will have the authority and responsibility to issue WSIs for their observing stations/platforms that do not have a legacy ID. However, the Annex to Resolution 35 of the [18th World Meteorological Congress](#) specifies circumstances in which the WMO Secretary-General is authorized to issue a WSI because no Member nation is in a position to do so.

<sup>12</sup> A convenient online source of ISO 3166 codes is [http://www.nationsonline.org/oneworld/country\\_code\\_list.htm](http://www.nationsonline.org/oneworld/country_code_list.htm). Note that only the three-digit numeric codes are used for Issuer of Identifier values in a WSI.

<sup>13</sup> IOC is the Intergovernmental Oceanographic Commission, a component of the United Nations Educational, Scientific, and Cultural Organization (UNESCO). [Resolution 9 of the 18th World Meteorological Congress](#) disbanded JCOMM and distributed its functions and activities to other WMO or partner-organization programs.

<sup>14</sup> The maximum value for a 16-digit binary number (all digits equal 1) is reserved to indicate a missing value. The decimal equivalent is 65535. That leaves 65534 as the maximum usable coding value that can be represented in a 16-bit field.

The WMO Secretariat has designated 0 (zero) as the Issue Number for all observing stations that had a WMO-sanctioned ID included in the WMO publication *Weather Reporting* (WMO-No 9), Volume A, on 1 July 2016.<sup>15</sup> These 5-digit IDs were traditionally called “block station numbers.”

For purposes of assigning new WSIs to observing stations/platforms they own or control, the various Federal agencies represented on the ICMSSR have agreed upon an assignment of Issue Number ranges by department/agency. As explained in Section 1.3, this Issue Number range is currently from 0 to 65534. Therefore, WSIs with Issuer of Identifier value 840 can have Issue Numbers anywhere in the range from 0 to 65534.

**Segment 4:** The *Local Identifier* is a sequence of up to 16 alphanumeric characters assigned to an observing station. Unlike the other segments of the WSI, which are numeric values only, the Local Identifier may contain numbers (0-9) and lower-case or upper-case Latin letters (a-z, A-Z).

A **general principle** of WSI assignment is to retain, if possible, an observing station/platform’s prior identifier (i.e., prior to 1 July 2016) as the Local Identifier in its WSI.<sup>16</sup> Section 1.2 explains how this principle plays out in practice for observing stations/platforms with legacy IDs. Section 1.3 explains how to apply the principle to stations/platforms that either (1) had a prior non-WMO ID, (2) are new stations/platforms that do not yet have a station ID, or (3) for some other reason need assignment of a new unique station ID using the WIGOS coding conventions.

## 1.2 WSIs from Legacy IDs

The four segments of the WSI for an observing station with a legacy ID (i.e. a WMO-sanctioned ID allocated prior to July 1, 2016) shall be assigned as follows:

### **Segment 1, WIGOS Identifier Series**

For observing stations/platforms with legacy IDs, the value of the WIGOS Identifier Series is always 0 (zero).

### **Segment 2, Issuer of Identifier**

For observing stations/platforms with legacy IDs, this segment has a value either between 20000 and 21999, as specified in Table 2.2 of the *Guide to WIGOS*, or between 22000 and 39999, as specified in Table 2.3 of the *Guide to WIGOS*. The first range applies to WMO programs that had sanctioned legacy IDs. The second range applies to legacy IDs of partner organizations that are recognized by the WMO. See Section 1.2.2 for examples drawn from both ranges.

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<sup>15</sup> The official list of Issuer of Identifier values specified for WMO programs (Issuer of Identifier in the range 20000–21999) and the Issue Number values these programs are using are maintained in Table 2.2 of the *Guide to WIGOS*.

<sup>16</sup> This principle as it applies to legacy IDs is evident in the diagram captioned “Outline of procedure for allocating a WIGOS station identifier” in Section 2.1.5 of the *Guide to WIGOS*.

### **Segment 3, Issue Number**

For observing stations/platforms with legacy IDs, the Issue Number is based on whether the station identifier was in use before 1 July 2016 for reporting data internationally. If the station identifier was in use on or before 1 July 2016, the Issue Number = 0 (zero).

#### **Land Stations with World Weather Watch–assigned Block Station Numbers.**

A land-based, fixed-location observing station that had a 5-digit block station number defined in *Weather Reporting* (WMO-No 9), Volume A, on 1 July 2016 has Issue Number = 0.

The WMO guidance suggests that a different Issue Number value can be assigned to the WSI for a particular observing station/platform to distinguish World Weather Watch observing facilities that have used or will use (in the future) the same legacy ID as the observing station/platform designated by that legacy ID on 1 July 2016. In other words, changes to the Issue Number can be used to show a station relocation or other changes to relevant station metadata.<sup>17</sup> The WMO has delegated the specific policy for when to increment the Issue Number to its Member nations.

**U.S. Policy for Fixed-location Land Stations.** For fixed-location land stations located within the United States or U.S territories or under U.S. control, the Issue Number shall be incremented in a station’s WSI when there has been a *significant change* to that station’s metadata but it is considered useful to retain the Local Identifier value. Pending further regulation and/or guidance from the WMO, a *significant change in location* of a U.S.-based or U.S.-controlled fixed-location, land-based observing station shall be a change in station elevation of 3 m or more or a change in horizontal location of 5 km or more.

The criterion for a significant change in location in this policy is based on the amount of either vertical (elevation) or horizontal distance that could be significant for numerical weather prediction (NWP) models. Note that the scale of various NWP models may range from synoptic to regional to local, and the same WIGOS observations reported on WIS-GTS need to be appropriate for use in any of these models.

Changes in sensors, other instrumentation or hardware, etc., should be documented by updating the station’s metadata, but such changes shall not by themselves warrant incrementing the Issue Number in that station’s WSI. Changes in location of mobile observing platforms are not relevant to changing the Issue Number segment of the platform’s WSI.

### **Segment 4, Local Identifier**

The general principle is that the station’s legacy ID becomes the Local Identifier segment in the WSI.

For land stations that had a World Weather Watch 5-digit block station number as their legacy ID, the block station number becomes the Local Identifier in the

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<sup>17</sup> See Table 2.2 in the *Guide to WIGOS*, in particular the second statement under “Issue Number” for each row in the table.

station's WSI. In principle, all of these stations were migrated into the OSCAR/Surface database (discussed in Section 1.2.1) by the WMO.

For surface observing stations/platforms that had a station ID assigned/approved by a WMO-recognized program on 1 July 2016 but that ID was not a World Weather Watch block station number (for example, WWW marine observing stations, ship identifiers based on the International Telecommunication Union (ITU) call sign, or Aircraft Meteorological Data Relay (AMDAR) identifiers),<sup>18</sup> the Local Identifier is still the legacy ID. Note that this Local Identifier could possibly be the same as the Local Identifier for an observing station that has a World Weather Watch 5-digit block station number. In such instances, the Issuer of Identifier segment will be necessary to distinguish between the observing stations/platforms by their WSIs.

The above rules for the WSI segments of observing stations/platforms with legacy IDs are illustrated by examples in Section 1.2.2 below. To follow these examples, it helps to be familiar with the principal WMO tool for recording the metadata and WSIs of observing stations/platforms that report observations using the WIGOS infrastructure of the WIS-GTS.

### **1.2.1 WMO Observing Systems Capability Analysis and Review Tool (OSCAR)**

The WIGOS Information Resource (WIR), which has a number of components, is designed to provide WIGOS stakeholders with all information relevant to the operational status of WIGOS and its observing components.<sup>19</sup> A key component of the WIR is OSCAR (Observing Systems Capability Analysis and Review tool), which currently comprises two component databases: OSCAR/Surface for the metadata on surface observing stations/platforms and OSCAR/Space for metadata on observing-satellites. OSCAR/Surface can be accessed online at <https://oscar.wmo.int/surface/index.html#/>. The metadata in both databases follow the metadata standards described in the *WIGOS Manual* and the *WIGOS Metadata Standard* (WMO-No. 1192).

The WMO Secretariat oversees the management of OSCAR. Each WMO Member nominates one or more focal points for OSCAR/Surface to maintain and correct the metadata in OSCAR/Surface for that nation's observing stations/platforms. The national focal point(s) for OSCAR/Surface are listed in each WMO Member's profile in the WMO Country Profile Database (<https://cpdb.wmo.int/>). The controls embedded in OSCAR/Surface prevent the accidental duplication of WSIs in the database.<sup>20</sup>

As of May 2020, the U.S. focal point for OSCAR Surface is Walter Smith, in the Data Management group of Central Operations in the National Centers for Environmental Prediction (NCEP), within

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<sup>18</sup> See Table 2.2 in the *Guide to WIGOS* for the WMO currently designated options.

<sup>19</sup> Attachment 2.2, "The WIGOS Information Resource," in the *WIGOS Manual* describes the WIR.

<sup>20</sup> "Duplication" here refers to exact duplication of *all four segments* in the WSI. Currently, the first segments of *all* WSIs (the WIGOS Identifier Series) are identical. As illustrated by examples in this Part, it is entirely possible that WSIs for different observing stations/platforms/locations may be identical in any two of their last 3 segments and still be valid WSIs. Thus, proper decoding of an observation that uses WSIs requires examination of at least the latter 3 segments of the WSI.

the National Weather Service (NWS).<sup>21</sup> A national focal point for OSCAR/Surface can also designate sub-focal-points to assist with the maintenance of metadata for that nation’s non-satellite observing stations and platforms. As of May 2020, designation of sub-focal-points for individual Federal agencies is in process.

After some illustrative examples in Section 1.2.2 of WSIs for observing stations/platforms that have a legacy ID, Section 1.2.3 provides additional guidance on using the OSCAR/Surface database and what to do if an observing station/platform with a legacy ID cannot be found in the database.

## 1.2.2 Examples of WSIs for Observing Stations and Platforms with a Legacy ID

**Example 1: Land Station with Co-located Surface and Upper Air Observing Stations with a Single WWW Block Station Number.** The NWS Weather Forecast Office (WFO) located at Amarillo International Airport, Amarillo, Texas, had WWW block station number = 72363 prior to 1 July 2016. This observing station has WSI:<sup>22</sup>

- 0-20000-0-72363

This WSI can be used for both surface and upper air observations/reports, as the observing instruments are co-located.

**Example 2: Single WWW Block Station Number but Differing Sub-Index Numbers for Observing Locations that are not Co-located.** The legacy ID for the WFO at Rapid City, South Dakota, is the block station number = 72662. At some time prior to 1 July 2016, the WFO moved to a site west of the South Dakota School of Mines and Technology. Upper-air observations are launched from the WFO location, but the surface observing station is still at the Rapid City Regional Airport location, several miles ESE of the site where upper-air observations are taken. Under the WWW, the surface observing station at the airport was assigned sub-index number (SI) = 0; the upper-air observing station at the relocated WFO was assigned SI = 1.

If you go to the [OSCAR/Surface database](#) and enter the block station number “72662” in the Quick Access search box labeled “WIGOS Station Identifier,” two choices of WSI will come up:

- For the surface station: 0-20000-0-72662
- For the upper-air station: 0-20001-0-72662

According to the rules in Table 2.2 of the *Guide to WIGOS*, the Issuer of Identifier segment for a WWW station with SI = 0 is 20000. The Issuer of Identifier segment for SI = 1 is 20001. Since

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<sup>21</sup> NWS is organizationally within the National Oceanic and Atmospheric Administration (NOAA), which is part of the U.S. Department of Commerce (DOC). A commonly used abbreviation for the Central Operations office is NOAA/NWS/NCEP/NCO.

<sup>22</sup> As noted at the beginning of Section 1.1, this guide uses the WMO convention of showing the four segments or components of a WSI as a sequential string with the components separated by hyphens. It would be technically more precise to say here, “The WSI for this observing station has the four segments indicated by the character strings separated by hyphens in the following shorthand notation:”

these observing stations were defined in *Weather Reporting* (WMO-No 9), Volume A, on 1 July 2016, the Issue Number segment (third segment) of their WSI = 0 (as specified in Table 2.2).

**NOTE:** If the radiosonde release location for this WFO had been relocated away from the surface observing station *after* 1 July 2016, then the WSI for the radiosonde release location would be assigned according to the rules for observing stations/platforms without a legacy ID. See Example 1 in Section 1.3.1 and the rules for dual-location stations in Part 2 of this guide.

**Example 3. WMO-sanctioned ID not a WWW Block Station Number.** Among observing stations/platforms in this category are (a) ships with identifiers based on their ITU call sign or with an International Maritime Organization (IMO) ship number (also called a hull number), (b) aircraft with an AMDAR identifier, (c) stations at airfields with an International Civil Aviation Organization (ICAO) airfield identifier (but not a WWW block station number), and (d) stations with a Global Atmosphere Watch (GAW) identifier. For a complete list, see Table 2.2 of the *Guide to WIGOS*.

For ships in the WMO Voluntary Observing Ship (VOS) scheme or in other WMO-sanctioned programs as of 1 July 2016, the Issuer of Identifier = 20003 when the ship's ITU call sign is used as its legacy ID (see Table 2.2, row 3, in *Guide to WIGOS*). For example, the ship with call sign MZGK7 assigned as of 1 July 2016 can be identified with the following WSI:

0-20003-0-MZGK7

This same ship also has an IMO hull number of 9193420. Following Table 2.2, row 7, of the *Guide to WIGOS*, this ship could also use the WSI:

0-20007-0-9193420

Legacy IDs for aircraft assigned/approved under the WMO AMDAR program must have Issuer of Identifier = 20005. For example, the AMDAR identifier for one U.S. aircraft is FIYWYWZA. Assuming the aircraft had that AMDAR identifier on 1 July 2016, Table 2.2 of the *Guide to WIGOS* specifies that its WSI shall be:

0-20005-0-FIYWYWZA

#### **Example 4. Ocean-observing Platforms with a 5-digit JCOMM Legacy ID**

Most data buoys, moored or drifting, whose observations were reported as part of the WWW prior to 1 July 2016 had 5-digit identifiers assigned or sanctioned by the JCOMM Data Buoy Cooperative Panel (DBCP).<sup>23</sup> In this guide, these identifiers are called *JCOMM legacy IDs*. During the preparation for and initial implementation of BUFR coding for marine platform observing data messages on GTS, JCOMM adopted a 7-digit identifier format for all ocean-observing platforms under its auspices. As of May 2020, the DBCP rules for allocating a 7-digit ID to ocean platforms

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<sup>23</sup> The DBCP, formed in 1985, was the data buoy component of JCOMM. With the disbandment of JCOMM by [Resolution 9 of the 18th World Meteorological Congress](#), the WG/OD has not learned whether the DBCP will continue or its functions will be assigned to another entity.

reporting on GTS were still available on the WMO legacy website page “[Rules for allocating WMO Numbers.](#)”

- The older 5-digit JCOMM legacy IDs for data buoys had two additional zeroes (00) added after their second digit to convert them to the 7-digit format, which also became the Local Identifier segment in the WSI for these data buoys.
- In general, marine observing stations and platforms that already had 7-digit JCOMM IDs have kept them as the Local Identifier segment of their WSI.<sup>24</sup>

This example illustrates how a 5-digit JCOMM legacy ID translates into a WSI. See Example 5 below and the examples in Section 1.3.2 for WSIs that incorporate 7-digit JCOMM legacy IDs as the Local Identifier segment.

As of May 2020, some, but not all, of the platforms that had 5-digit JCOMM legacy IDs are included in OSCAR/Surface with WSIs that follow the rules specified in Table 2.3 of the *Guide to WIGOS* and the JCOMM rule for converting the 5-digit legacy ID to a 7-digit Local Identifier segment. The Issuer of Identifier segment assigned to them is 22000. For example, the data buoy with JCOMM legacy ID = 51003 is owned and maintained by the (U.S.) National Data Buoy Center (NDBC). It is located 205 NM southwest of Honolulu, Hawaii (19.20 N 160.60 W). This station was reporting under its JCOMM legacy ID on 1 July 2016. With its legacy ID expanded to 7 digits as its Local Identifier segment and the Issuer of Identifier segment showing that the identifier was administered (in the past) through the JCOMM in situ Observations Programme Support Center (JCOMMOPS), its WSI in OSCAR/Surface appears as:

0-22000-0-5100003

Another example is the data buoy located 105 NM west of Juneau, Alaska (58.3 N 137.997 W). Its 5-digit JCOMM legacy ID was 46083. Its WSI in OSCAR/Surface is shown as:

0-22000-0-4600083

### **Example 5. Marine Platforms with JCOMM-Assigned 7-Digit IDs**

Even prior to 1 July 2016, JCOMMOPS was assigning 7-digit IDs to marine profiling floats and gliders and to instrumented marine mammals. For example, the subsurface profiling float with JCOMM legacy ID 2902656 has the following WSI in OSCAR/Surface:

0-22000-0-2902656

Section 1.2.3 explains how the OSCAR/Surface database can be used to determine whether a 7-digit JCOMM-assigned legacy ID has been allocated a complete WSI. For further examples comparing the WSI assignments for marine platforms with a JCOMM legacy ID (5-digit and 7-

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<sup>24</sup> As of this release of this guide, the 5-digit buoy identifiers are still being used in the older (pre-BUFR) TAC code format. Only a converted 5-digit data buoy identifier has “00” as the 3rd and 4th digit in the 7-digit format specified for use in pre-WIGOS BUFR messages and as the Local Identifier segment of a WSI for a platform with a JCOMMOPS legacy ID. Any other values of the 3rd and 4th digits indicate a marine observing platform that was originally assigned a 7-digit JCOMMOPS identifier.

digit IDs) with new platforms (or platforms that had prior non-WMO IDs) that will now have U.S. agency–assigned WSIs, see the marine platform examples in Section 1.3.2 below.

### **1.2.3 Using OSCAR/Surface to Check the WSI for Observing Stations/Platforms with a Legacy ID**

Knowing the legacy ID for a fixed-location, land-based observing station (the 5-digit block station number) or a 5-digit or 7-digit JCOMM legacy ID does not automatically determine the second and third components of the WSI (Issuer of Identifier and Issue Number). You can confirm the assigned WSI for a block station number or determine whether a JCOMM legacy ID has an assigned WSI by checking the OSCAR/Surface database.

1. Go to <https://oscar.wmo.int/surface/index.html#/>.
2. In the Quick Access block for WIGOS Station Identifier (left side of page), enter the appropriate sequence:
  - For a 5-digit block station number, enter that number in the WIGOS Station Identifier search block.
  - For a 5-digit JCOMM legacy ID (for a data buoy), add the two zeroes into the sequence as the 3rd and 4th digits. Enter the 7-digit sequence in the WIGOS Station Identifier search block.
  - For a 7-digit JCOMM legacy ID, enter the 7 digits in the WIGOS Station Identifier search block.
3. If the database has any WSIs with the entered sequence anywhere in the WSI, OSCAR will show the results in a list just below the search block. If no WSI has that sequence in any components, OSCAR displays a “No matches found” result.
4. Click on one of the listed WSI options to see details on the station/platform that has that WSI.
5. For a 5-digit or 7-digit JCOMM legacy ID, if you get a “No matches found” result in the WIGOS Station Identifier search field, try entering the 7-digit sequence (for 5-digit buoy numbers, add two zeroes as the 3rd and 4th digits) in the Station name search field.
  - Click on the listed station name to see the record for that marine observing platform. You should see that the WIGOS Station Identifier field in the record is blank.
  - If you get a “No matches found” result, the numeric sequence does not occur in the station name used in any OSCAR/Surface records.

#### **What if an Identifier Thought to be a Legacy ID Block Station Number is not in OSCAR/Surface?**

In principle, all fixed-location land-based stations that had WWW–sanctioned 5-digit block station numbers as of 1 July 2016 were migrated into OSCAR/Surface by the WMO. Using the above

procedure to search the database using the WIGOS Station Identifier search box should locate the record for any legacy ID station that is still operational. A “No matches found” result could have the following explanations:

1. The observing station ceased operating before the migration of block station numbers into OSCAR/Surface. To rule out this possibility, confirm that the station is still operational and reporting on the WIS-GTS.
2. The 5-digit station ID is a prior non-WMO ID or identifies a station/platform added after 1 July 2016. In either case, it is not actually a legacy ID (as defined at the end of Section 1.0).
3. The 5-digit sequence being searched is incorrect for the observing station in question. To rule out this possibility, confirm that the 5-digit sequence is correct for the station of interest.
4. There is an error in the OSCAR/Surface database record for the station.

As an example of #2, the NWS WFO at Sterling, Virginia, has used the temporary identifier 72413 when conducting field tests of new radiosonde hardware and software. This identifier is not WMO-sanctioned and is therefore a prior non-WMO ID. Entering this identifier in the WIGOS Station Identifier search box on the OSCAR/Surface homepage gives a “No Matches Found” result.

Another possibility is that a new land-based station is using a 5-digit identifier that looks like a legacy ID block station number. In either case, use the procedures in Section 1.3. to determine an appropriate WSI for the observing station and ensure it is added to OSCAR/Surface.

To eliminate such cases, (1) verify that the block station number was in the last edition of *Weather Reporting* (WMO-No 9), Volume A, and (2) verify that this fixed-location land-based station has recently reported observations on the WIS-GTS.

If both of these conditions have been verified, then submit your information about the observing station either to the U.S. focal point for OSCAR/Surface or to an appointed sub-focal-point.<sup>25</sup>

Refer to the *WIGOS Manual* for metadata specifications to be used in the OSCAR/Surface station record. There are three ways to submit station metadata corrections and updates to the U.S. focal point for OSCAR/Surface.

**Option 1.** Go to the web page of the Data Management group in NOAA/NCEP Central Operations (<https://www.weather.gov/datamgmt/>) and click on "New OSCAR Portal" to submit the station information.

**Option 2.** Email your request to add the station, with the relevant station metadata, to the Data Management group at [ncep.pmb.dm@noaa.gov](mailto:ncep.pmb.dm@noaa.gov).

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<sup>25</sup> Several sub-focal-points in other Federal agencies have been appointed, and those individuals also have update access to OSCAR/Surface.

**Option 3.** Call the Data Management group line (301) 683-0756 in College Park, Maryland.

### **What if the Metadata Listed for an Observing Station/Platform in OSCAR is Incorrect or Needs to be Updated?**

If an observing station/platform under U.S. control is found in OSCAR/Surface but its metadata are incorrect or need to be updated, you can use the same three options listed above for contacting the U.S. focal point for OSCAR/Surface. You can also contact the sub-focal-point in the Federal agency responsible for that station/platform. Refer to the *WIGOS Manual* for metadata specifications to be used in the OSCAR/Surface station record. These same options apply to submitting metadata and WSI assignments for new observing stations/platforms (see Section 1.3 for WSI assignment guidance).

If you believe the metadata for a non-U.S. observing station/platform are incorrect or need to be updated, you have two options. Either (1) report the issue to the U.S. focal point for OSCAR/Surface or to the sub-focal-point for your Federal agency or (2) contact a national focal point for OSCAR/Surface of the nation responsible for the station/platform in question. The national focal point(s) for OSCAR/Surface are listed in each WMO Member's profile in the WMO Country Profile Database (<https://cpdb.wmo.int/>). This second option works best if you or your Federal agency have a working relationship with the entity in which the foreign national focal point works. Otherwise, it is probably best to report the problem using the first option.

### **1.3 WSI Assignment for Observing Stations/Platforms without Legacy IDs**

This section provides guidance on how to assign values for the four components of the WSI for a new observing station/platform (“new” means a station/platform not yet reporting on WIS-GTS). The guidance on assigning WSIs is the same for both new observing stations and platforms (those that did not exist prior to 1 July 2016) and stations that did exist before 1 July 2016 but have a prior non-WMO ID (as defined in Section 1.0). After the rules and guidance for each of the four segments of a new WSI are presented, Section 1.3.1 applies the rules and guidance to some examples for fixed-location land-based observing stations. Section 1.3.2 provides examples for marine observing platforms.

If you do not have update access to OSCAR/Surface (that is, you are neither the U.S. focal point for OSCAR/Surface nor an agency sub-focal-point appointed by the U.S. focal point), your proposed WSI assignment and complete metadata for each new station must be submitted to the U.S. focal point or the appropriate sub-focal-point for inclusion in OSCAR/Surface *before* the WSI can be used to transmit observations on WIS-GTS from that station/platform. See Section 1.2.3 (above) for options to contact the U.S. focal point for OSCAR/Surface.

#### **Segment 1: WIGOS Identifier Series**

As with all other WSIs, until the WMO defines another identifier series, the WIGOS Identifier Series segment must be 0.

**Segment 2: Issuer of Identifier**

For all U.S. Federally owned or controlled observing stations and platforms without legacy IDs, the Issuer of Identifier segment is 840. For observing stations/platforms that are not Federally owned/controlled but are located in U.S. States or territories (e.g., State owned/controlled stations such as highway weather observing stations or private/commercial stations), the Issuer of Identifier segment will also be 840.

**Segment 3: Issue Number**

The WG/OD has assigned the Issue Number ranges shown in Table 1 to Federal entities that control or oversee new observing stations/platforms. Assignment of Issue Number values within these ranges is managed by the specified Federal entity. The third column of Table 1 lists the responsible issuing agency/office for information on Issue Number assignments. State-owned or -controlled observing stations/platforms shall contact the Office of Data Management in NWS/NCEP Central Operations to be assigned an appropriate Issue Number.

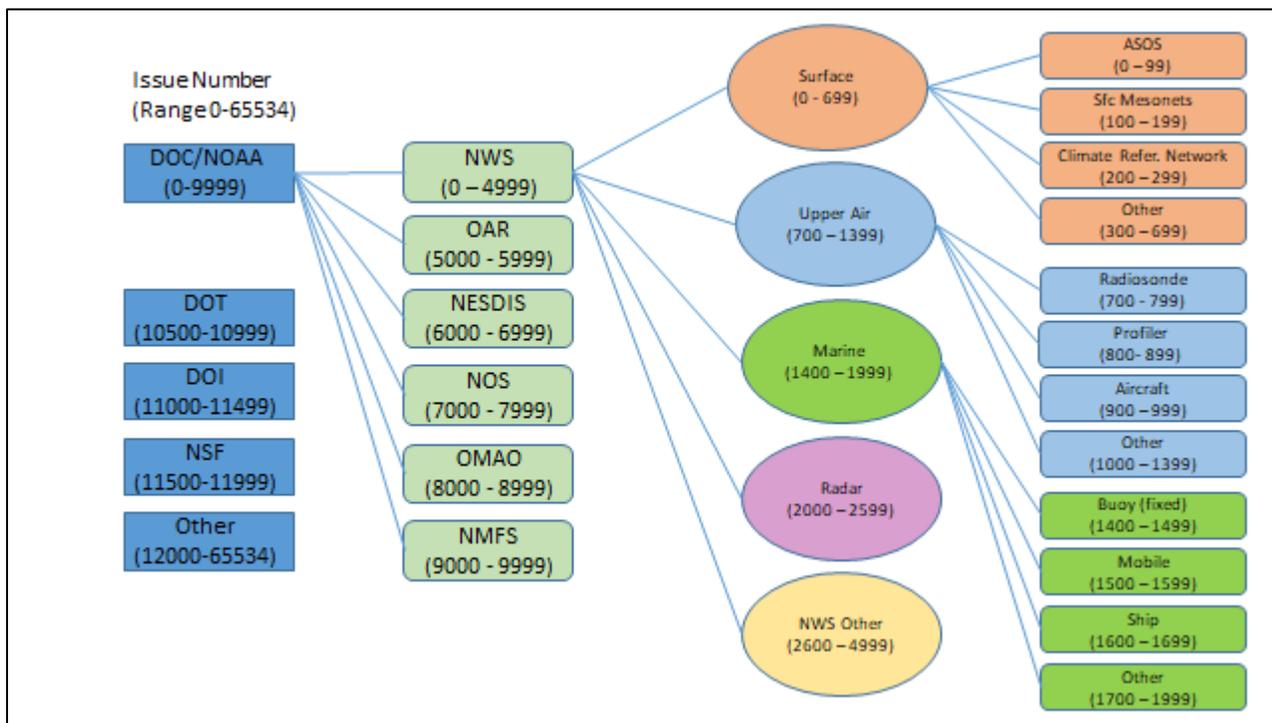
**Table 1. Assigned Issue Number Ranges for Issuer of Identifier = 840**

Issue Number Range	Federal Entity	Sub-Focal Point for Issue Number Assignment within Range
0–9999	Department of Commerce/NOAA	NWS Data Management in NCEP/NCO (Central Operations)
10000–10499	Department of Defense	Assignment office not yet formally identified. See Note 1
10500–10999	Department of Transportation	Assignment office not yet formally identified. See Note 1
11000–11499	Department of the Interior	Assignment office not yet formally identified. See Note 1
11500–11999	National Science Foundation	Assignment office not yet formally identified. See Note 1
12000–65534	Other (subranges to be assigned)	NWS Data Management in NCEP/NCO (Central Operations)
Note 1: Until a sub-focal-point is formally designated, contact the U.S. focal point for OSCAR/Surface for approval of Issue Number assignments; see Section 1.2.3.		

As of May 2020, specific Issue Number values within the ranges shown in Table 1 have not yet been assigned by any of the Federal entities managing an assigned range. For the purpose of illustrating how the rules should be applied, Figure 1 shows a *possible* (hypothetical) scheme for how one entity, the NWS, might decide to allocate values in the Issue Number range assigned to it. In this made-up case, the Department of Commerce has assigned NWS the Issue Number range from 0 to 4999, with other parts of NOAA assigned the Issue Number ranges shown in the second column of boxes in Figure 1. NWS can now allocate its assigned Issue Numbers as it decides (without requiring review or approval from WMO, from higher levels in the Department of Commerce, or from higher levels in NOAA). The ovals and rectangles in the right half of Figure 1 illustrate one way NWS might allocate Issue Numbers to different types of observing

stations/platforms for which it is responsible. The examples below use and extend this Issue Number allocation scheme.

**Figure 1. Hypothetical Issue Number Allocation for the National Weather Service**



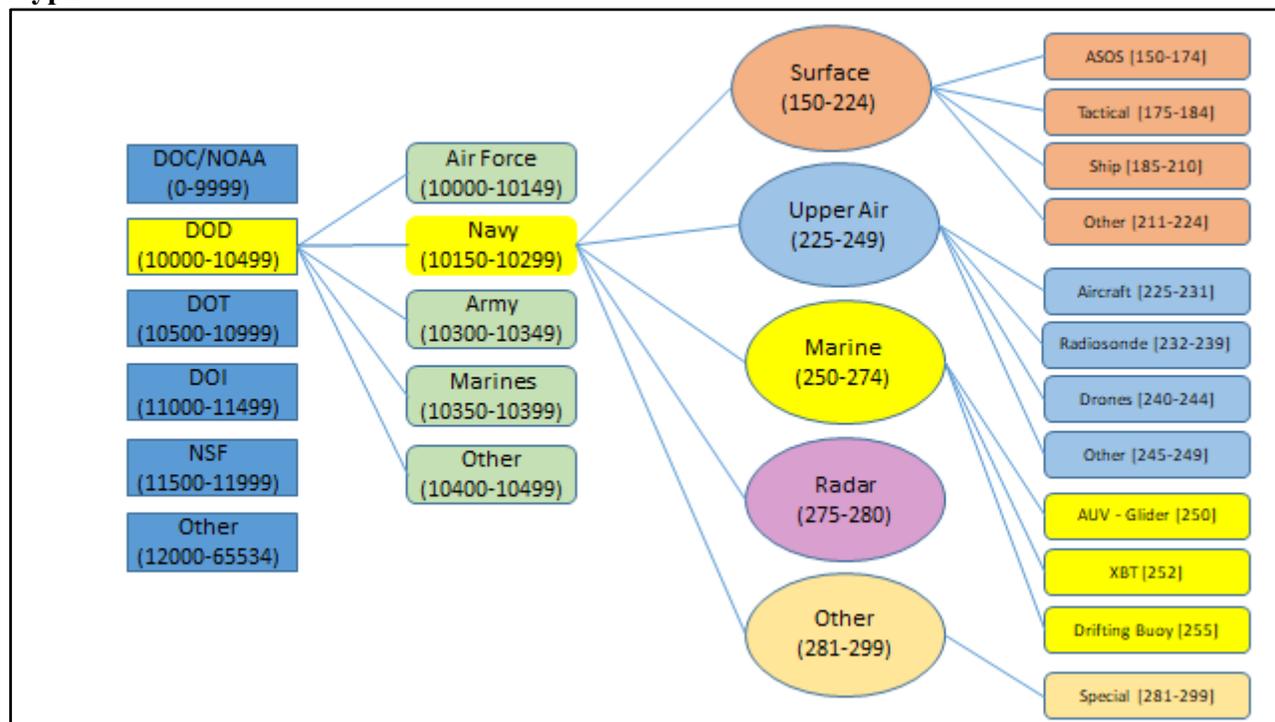
Although the assignment of Issue Number values within an assigned range is managed by the cognizant Federal entity, the WG/OD recommends that Issue Number values be assigned such that an incremented value can be used to show a significant relocation of a fixed-location land-based station (*significant* defined as 3 m or more change in elevation or 5 km or more change in horizontal location, following the policy stated in Section 1.2), similar to how an incremented Issue Number value is used to show changes to fixed-location land-based stations with legacy IDs (see Section 1.2 above). For instance, if a radiosonde release point for an NWS WFO had been assigned a WSI with 700 as the Issue Number, following the allocation scheme shown in Figure 1, then a significant change in location of that radiosonde release point could be indicated by incrementing the Issue Number to 701 in the WSI for just that WFO. The other segments of the WSI would remain the same.

The examples in Section 1.3.1 for assigning WSIs to new WFOs or radiosonde release points illustrate how this “incremented value” approach to significant metadata changes can be implemented. This recommendation for incrementing the Issue Number does not apply to mobile platforms such as drifting buoys, mobile underwater profilers, aircraft, or ships.

Figure 2 shows a similarly hypothetical scheme for one way the U.S. Department of Defense (DOD) *might decide* to divide up the Issue Number range assigned to it in Table 1—Issue Numbers from 10000 to 10499—and a hypothetical way the U.S. Navy *might* choose to allocate its assigned range (Issue Numbers from 10150 to 10299) to different types of its observing stations/platforms.

For the purpose of the examples presented in Section 1.3.2, Table 2 expands on this hypothetical assignment of Issue Numbers by the Navy to seven specific types of marine observing platforms, plus a range for “other” marine platforms without an assigned range.

**Figure 2. Hypothetical Issue Number Assignments for the U.S. Navy by Observing Platform Type**



**Table 2. Hypothetical Issue Number Ranges for U.S. Navy Marine Observing Platforms**

Issue Number Range <sup>a</sup>	Observation Types
<b>10250-10274</b>	US NAVY Marine Observing Platforms
<b>10250</b>	Autonomous Vehicles AUV/UUV
<b>10251</b>	TESAC
<b>10252</b>	XBT Temperature profile data
<b>10253</b>	Profiling Floats
<b>10254</b>	Moored Buoys
<b>10255</b>	Drifting Buoys
<b>10256</b>	Marine Animal
<b>10257-10274</b>	Other (to be assigned)

Note that this hypothetical illustration assumes the Navy is using consecutive Issue Number values in the range from 10250 to 10256 for different types of observing platform. Since most of the Navy’s marine observing stations/platforms are mobile, the illustration assumes the Navy has chosen not to increment Issue Numbers even for relatively fixed platforms such as moored buoys.

### **Segment 4: Local Identifier**

The following rules have been adopted by the WG/OD for assigning the Local Identifier segment when the Issuer of Identifier is 840 and the station does not have a legacy ID:

1. When a new observing station/platform is part of an existing network of observing stations/platforms that use a WMO-sanctioned identifier schema, assign a Local Identifier that would be unique but consistent with the existing identifier schema in that network.
2. When a new network of stations is being assigned WSIs, the Local Identifier values should follow existing WMO ID allocation guidance when possible.

While it was active, the DBCP issued identifier-allocation rules for ocean observing platforms including drifting and moored buoys, rigs and offshore platforms, OceanSITE and autonomous vehicles, profiling floats, and marine animals equipped with observing instruments. As of May 2020, this guidance was still available at [this legacy WMO site](#).

3. If it is not possible to follow Rules 1 and/or 2, create unique Local Identifier sequences that are dissimilar to WMO-sanctioned identifier schemes by using alphabetic characters with or without numbers and/or through the use of identifiers longer than seven characters. Remember that the Local Identifier may contain numbers and lower-case or upper-case Latin letters. Also note that leading zeroes in a Local Identifier are considered part of the segment's value and cannot be dropped/ignored.

#### **1.3.1 Examples of WSI Assignment for NWS Land-based Observing Stations without Legacy IDs**

Examples 1 through 4 use the hypothetical Issue Number assignments shown in Figure 1 and Table 1.

**Example 1. Adding a New Station with a Single Observation Type in an Existing Network.** Suppose the NWS installs a wind profiler station at Provo, Utah, and data from this station will be reported through the WWW program using WIS-GTS. Further suppose that NWS is following the Issue Number allocation schema shown in Figure 1. Under that schema, the initial Issue Number for a new wind profiler installation is 800. Because this station will be reporting through the GTS as a WWW station, NWS should follow the “best practice” of trying to assign a Local Identifier that is consistent with the existing WWW network in the United States. The new station is in NWS’s Western Region, which is headquartered in Salt Lake City, Utah. The Local Identifier for the WWW station (an ASOS at the Carbon County airport) in Price, Utah, is 72470 (derived from its WWW legacy ID), and the string 72471 has not been issued to a WWW station operated by NWS. So 72471 would be a good choice for the new station’s Local Identifier. Its full WIGOS Station Identifier will therefore be:

0-840-800-72471 (possible WSI for new WWW wind profiler station)

Compare this WSI with the WSI for the Price, Utah, ASOS, which was already a WWW station on 1 July 2016 and therefore follows the rules in Section 1.2 for legacy IDs:

ASOS at Price/Carbon County Airport, UT = 0-20000-0-72470

**Example 2. Adding a New Station with Multiple Observation Types to an Existing Network.**

Suppose that instead of installing just a wind profiler station at Provo, Utah, as in Example 1, the NWS opens a new WFO that operates both an ASOS surface-observing platform and a radiosonde release location. The data from both observation types will be reported through the WWW using WIS-GTS. As in Example 1, the Local Identifier value of 72471 is still a good choice for the new station. But different Issue Number values can be used to create WSIs that distinguish the ASOS data from the radiosonde data:

0-840-0-72471      (WSI for the ASOS data)

0-840-700-72471      (WSI for the radiosonde data)

Note that this approach of assigning multiple WSIs to one “station” to distinguish different types of observations differs from prior WMO practice of assigning one block station number and distinguishing observation types using sub-index numbers. These sub-index numbers were carried in the WMO’s station metadata document but were not embedded in the GTS data messages in any way.

At a number of NWS WFOs, that office’s ASOS location may be at some distance from its radiosonde release point. Such situations, which raise issues about ensuring that accurate location metadata are used in NWP modeling for the different observation types, are addressed in detail in Part 2 of this guide, under the topic of *Dual-Location Stations*.

**Example 3. Significant Change in Metadata Shown by Incrementing Issue Number.**

Suppose that at some time in the future both observing stations described in Example 1 (ASOS with legacy ID at the Carbon County Airport, Utah, and the new wind profiler at Provo, Utah) are relocated for some reason or other, and either the elevation at the new location differs by 3 m or more, the horizontal distance from the old location is 5 km or more, or both. To alert users of the data that the location metadata have changed from earlier reports, NWS increments the Issue Number values for the two stations as follows:

Provo, Utah wind profiler (after metadata change) = 0-840-801-72471

ASOS at Price/Carbon County Airport, UT (after metadata change) = 0-20000-1-72470

**NOTE:** Since the WSI for the Price/Carbon County station indicates that the Issuer of Identifier is a WMO program, the U.S. focal point for OSCAR/Surface will need to request/coordinate with the WMO Secretariat for approval of the updated WSI. If the WMO Secretariat declines to accept/approve the revised WSI for this legacy station and specifies that the new WSI be assigned at the national level and in accordance with the national WSI schema, then the WSI would become:

ASOS at Price/Carbon County Airport, UT (after metadata change) = 0-840-0-72470

If a second significant location change were to occur for either observing station (elevation change of 3 m or more; horizontal change of 5 km or more), the Issue Number could again be incremented by 1.

**Example 4. Adding A New Station to the Global Atmosphere Watch Network.** Suppose NWS decides to add an atmospheric composition observing site at Richmond, Virginia. This site will become part of the U.S. contribution to the Global Atmosphere Watch (GAW) data carried on the WIS-GTS. Prior to 1 July 2016, GAW sites were assigned three-character identifiers. For example, the GAW site maintained by NWS at Sterling, Virginia, has GAW Identifier = SVA as its legacy ID. Following Table 2.2 in the *Guide to WIGOS*, the appropriate Issuer of Identifier segment for the Sterling site is 20008 and Issue Number = 0.

Further suppose that NWS is following the Issue Number schema in Figure 1 for the new Richmond site and the WG/OD guidance for incrementing Issue Numbers when station metadata change significantly. It will therefore assign Issue Number = 300 to the new site. Following the pattern of GAW identifiers that was used prior to 1 July 2016, a three-character Local Identifier for the new Richmond station consistent with past naming practice would be RVA, and that ID is not in use for any other NWS atmospheric composition monitoring station. So these two GAW monitoring sites, one with a legacy ID, the other with a NWS-assigned Local Identifier, would have the following full WSIs:

Sterling, Virginia (station has legacy ID) = 0-20008-0-SVA

Richmond, Virginia (new station, no legacy ID) = 0-840-300-RVA

If the locations of these two stations were to change significantly (3 m or more in elevation, 5 km or more horizontally), then the Issue Number in each WSI would be incremented by 1:

Sterling, Virginia (after significant metadata change) = 0-20008-1-SVA

Richmond, Virginia (after significant metadata change) = 0-840-301-RVA

### 1.3.2 Examples of WSI Assignment for Marine Observing Platforms

The examples in this section use either actual JCOMM-assigned legacy IDs for marine platforms or assume the hypothetical Issue Number assignment schemas shown in Figure 2 and Table 2, above. Examples 5 and 7 use actual JCOMM legacy IDs, and the platform's WSI can be found in OSCAR/Surface. The other examples are hypothetical cases that assume the platform is a new U.S. Navy platform and the Navy has created an appropriate Local Identifier segment for the platform's WSI.

**Example 5. AOML Drifting Buoy with 7-digit JCOMM-assigned ID.** A drifting buoy operated by the NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML) has the JCOMM-assigned 7-digit ID of 6401539. The Issuer of Identifier in this case is 22000 and the Issue Number is 0, both of which are in accordance with Table 2.3 in Section 2.5.1 of the *Guide to WIGOS*. So the complete WSI, which can be found in OSCAR/Surface, is:

0-22000-0-6401539

**Example 6. New U.S. Navy Drifting Buoy with Navy-Assigned Local Identifier Segment.** In this hypothetical example, the Navy is launching a new drifting buoy, so it does not have a 7-digit JCOMM-assigned identifier. Instead, the Navy creates a new value for the Local Identifier segment, following a naming pattern it has defined for new marine platforms. This new Local Identifier uses 11 of the 16 allowed alphanumeric characters in a Local Identifier segment: 31245135547. The Issuer of Identifier is 840. According to the hypothetical schema in Table 2, the Issue Number = 10255. So the complete WSI for this new drifting buoy will be:

0-840-10255-31245135547

**Example 7. Profiling Float with 7-digit JCOMM Legacy ID.** This case is similar to Example 5 above, except that the platform in question is a French profiling float that has the JCOMM-assigned ID of 6901450. The complete WSI, which appears in OSCAR/Surface, is:

0-22000-0-6901450

**Example 8. New U.S. Navy Profiling Float with Navy-Assigned Local Identifier Segment.** In this hypothetical case, the Navy assigns the Local Identifier TELE000117 to a new profiling float. (Note that the WMO allows the Local Identifier segment to use alpha characters as well as numerals; the other three segments of a WSI must be numeric only.) Following the Issue Number schema suggested in Figure 2 and Table 2, the complete WSI will be:

0-840-10253- TELE000117

**Example 9. U.S. Navy Sea Glider with 7-digit JCOMM Legacy ID.** In this hypothetical example, if the JCOMM-assigned legacy platform ID were 6801450, then the complete WSI for this sea glider, conforming to Table 2.3 in the *Guide to WIGOS*, will be:

0-22000-0-6801450

**Example 10. New U.S. Navy Sea Glider with Navy-Assigned Local Identifier Segment.** Sea gliders are included in the category of autonomous underwater vehicles (AUVs), so according to Table 2 above, the Issue Number for this platform is 10250. For this example, assume the Navy's Local Identifier assignment for this platform is NG387. As in Example 8 above, this sequence reflects a naming pattern the Navy has (hypothetically) adopted for new sea glider platforms. The complete WSI for the platform will therefore be:

0-840-10250-NG387



## APPENDIX 1.A ANNOTATED BIBLIOGRAPHY OF KEY REFERENCES FOR WIGOS IMPLEMENTATION

WMO. (2019). *Guide to the WMO Integrated Global Observing System*, WMO-No. 1165, 2019 edition. Geneva, Switzerland: World Meteorological Organization. Available online at [https://library.wmo.int/index.php?lvl=notice\\_display&id=20026](https://library.wmo.int/index.php?lvl=notice_display&id=20026).

The *Guide to WIGOS* provides technical guidelines and guidance information to complement the *Technical Regulations*, Volume 1, Part 1 (WMO-No. 49) and the *Manual on the WMO Integrated Global Observing System: Annex VIII to the WMO Technical Regulations* (WMO-No 1160). The 2019 edition covers: (a) the system of WIGOS station identifiers (WSIs); (b) the new requirements to record and make available metadata as specified in the WIGOS Metadata Standard; (c) the Observing Systems Capability Analysis and Review (OSCAR) tool, which WMO Members must use to document metadata for WMO global compilation; and (d) the new observing system (WIGOS) design principles.

WMO. (2019). *Manual on the WMO Integrated Global Observing System: Annex VIII to the WMO Technical Regulations*. WMO-No 1160, 2019 edition. Geneva, Switzerland: World Meteorological Organization. Available online at [https://library.wmo.int/index.php?lvl=notice\\_display&id=19223](https://library.wmo.int/index.php?lvl=notice_display&id=19223).

According to the statement of Purpose and Scope in this document's introduction, the *Manual* is designed to (a) specify the obligations of WMO Members in implementing and operating WIGOS, (b) facilitate cooperation in observations between members, and (c) ensure adequate uniformity and standardization in the practices and procedures employed in achieving (a) and (b). The *Manual* specifies what is to be observed and what practices and procedures are to be followed in order to meet the relevant observational requirements of WMO Members.

The Manual also contains detailed specifications for observing station metadata, which apply to making corrections, updates, or new station entries in OSCAR/Surface.

WMO. (2019). *OSCAR/Surface User Manual*. 2019 edition. Geneva, Switzerland: World Meteorological Organization. Available online at: [https://library.wmo.int/index.php?lvl=notice\\_display&id=20824](https://library.wmo.int/index.php?lvl=notice_display&id=20824).

Section 1 is a 3-paragraph introduction to the manual. Section 2 explains how to search OSCAR/Surface to find information on observing stations and their metadata. Section 3 is intended for users with update access and describes how to manage the station information and metadata in the database.

WMO. (2019). *WIGOS Metadata Standard*, 2019 edition. WMO-No. 1192. Geneva, Switzerland: World Meteorological Organization. Available online at [https://library.wmo.int/index.php?lvl=notice\\_display&id=19925](https://library.wmo.int/index.php?lvl=notice_display&id=19925)

This is the WMO's technical authority and specification document on metadata for the WIGOS infrastructure.

WMO. (2019) *World Meteorological Congress: Abridged Final Report of the Eighteenth Session*. Geneva, 3-14 June 2019. WMO-No. 1236. Geneva, Switzerland: World Meteorological Organization. Available online at: [https://library.wmo.noclick\\_int/index.php?lvl=notice\\_display&id=21440](https://library.wmo.noclick_int/index.php?lvl=notice_display&id=21440)

Most of this document consists of Appendix 2, containing the resolutions passed at the 18th World Meteorological Congress and annexes to those resolutions. Resolutions of particular relevance to WIGOS and WSI implementation are Resolution 9 (disbandment of JCOMM), Resolution 35 and Annex (delegation of WSI-issuing authority to four international programs and situations in which the WMO Secretary-General may issue WSIs), and Resolution 37 and Annex (transition of WIGOS to an Initial Operational Period commencing on 1 January 2020).

WMO. (2018). *Manual on Codes: International Codes. Volume 1.2, Annex II to the WMO Technical Regulations, Part B–Binary Codes. Part C–Common Features to Binary and Alphanumeric Codes*. (WMO-No. 306). 2015 Edition, Updated in 2018. Geneva, Switzerland: World Meteorological Organization. Available online at: [https://library.wmo.int/index.php?lvl=notice\\_display&id=10684](https://library.wmo.int/index.php?lvl=notice_display&id=10684).

WMO-No. 306 is the official WMO manual on BUFR.

WMO. (2018). *Technical Regulations. Volume I: General Meteorological Standards and Recommended Practices*. (WMO-No. 49). 2018 Update. Geneva, Switzerland: World Meteorological Organization. Available online from the WMO Bookstore at [https://library.wmo.int/index.php?lvl=notice\\_display&id=14073](https://library.wmo.int/index.php?lvl=notice_display&id=14073).

This volume contains WMO's technical regulations for the World Weather Watch; climatology; meteorological services for marine activities, agriculture and environmental pollution; meteorological bibliography and publications; education and training; and units and procedures used in international meteorological research programs and during special observational periods.

WMO (2017). Circular Letter from WMO Secretariat, "Reporting of WIGOS Station Identifier in BUFR/CREX messages." 30 October 2017. WMO Reference: 37992/2017/OBS/WIS/DRMM/DRC/WIGOS/ID. PDF available via search on: [WMO Circular Letter 2017-10-30](#),

This letter specifies WMO guidelines for introducing WSIs in WIS-GTS messages using either the BUFR or CREX code forms.

WMO. (2012). *Weather Reporting, Volume A: Observing Stations and WMO Catalogue of Radiosondes*. (WMO-No. 9). Geneva, Switzerland: World Meteorological Organization.

The lists of observing stations by WMO Region in the 2012 version of this volume were used as the initial upload to the OSCAR/Surface database. Historical information about WMO Publication No. 9, Volume A, can be found at [this WMO webpage](#).

For differences in the field attributes between Vol. A and OSCAR/Surface, see [Format Differences between the Current WMO No. 9, Volume A \(VolA\) Fields and the OSCAR Export into a VolA Alike File](#).

WMO. (2002). *Guide to WMO Table Driven Code Forms: FM 94 BUFR and FM 95 CREX*. 1 January 2002, Geneva. Available online at [https://www.wmo.int/pages/prog/www/WMOCodes/Guides/BUFRCREXPreface\\_en.html](https://www.wmo.int/pages/prog/www/WMOCodes/Guides/BUFRCREXPreface_en.html).

The first volume of this 2-volume documentation has two parts: Layer 1 covers basic aspects of BUFR and CREX; Layer 2 covers layout, functionality, and application of the two table-driven code forms. The second volume contains Layer 3, the detailed description of the code forms and is intended for programmers of message encoding/decoding software.

WMO. (1993). *Guide on World Weather Watch Data Management*. (WMO-No. 788). Geneva, Switzerland: World Meteorological Organization. Available online from the WMO Bookstore at [https://library.wmo.int/index.php?lvl=notice\\_display&id=7665](https://library.wmo.int/index.php?lvl=notice_display&id=7665).

This guide, of historical value for origins and implementation of WIGOS, documents the concepts and principles of World Weather Watch (WWW) data management; technical information on data management issues for which clear direction was not given in previous WMO statements of specifications, regulations, etc., and a technical record of the strategic direction for WWW data management circa 1992.



**APPENDIX 1.B**  
**WMO GUIDELINES ON REPORTING WSIs**  
**IN BUFR MESSAGES<sup>26</sup>**

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<sup>26</sup> The document reproduced here, CircularLetter\_2017-10-30-OBS-WIS-DRMM-DRC-WIGOS-ID\_en.pdf, is also available online via [this link](#).



**WMO OMM**

World Meteorological Organization  
Organisation météorologique mondiale  
Organización Meteorológica Mundial  
Всемирная метеорологическая организация  
المنظمة العالمية للأرصاد الجوية  
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Ref.: 37992/2017-1.4 OBS-WIS/DRMM

Our ref.: 37992/2017/OBS/WIS/DRMM/DRC/WIGOS/ID

30 October 2017

Annex: 1

Subject: Reporting of WIGOS Station identifier in BUFR/CREX messages

Action required: To refer to the guidelines for introducing the WIGOS Station identifier in FM 94 BUFR and FM 95 CREX messages

Dear Sir/Madam,

I wish to refer to the Annex to [Resolution 26 \(Cg-17\)](#), by which the WIGOS Station Identifier (WSI) was defined in the Attachment 2.1 of the *Manual on the WIGOS* (WMO-No. 1160). On 3 May 2017, the WSI was introduced as a Table D entry in FM 94 BUFR/FM 95 CREX through the amendments to the *Manual on Codes* (WMO-No. 306) by the fast-track procedure.

The first meeting of the CBS Inter-Programme Expert Team on Codes Maintenance (IPET-CM) took place from 24 to 28 July 2017. The IPET-CM highlighted the risk from underestimating the impact of introduction of the WSI, which has the potential to impact all systems tasked with processing and storage of observational data with traditional station identifiers.

Keeping the above in mind, the IPET-CM recognized necessity of guidelines to report the WSI in BUFR and CREX messages so as not to create additional difficulty in existing processing and storage systems. It therefore proposed to remind WMO Members of procedural and technical guidelines, which are specified in the Annex to this letter.

The president of the Commission for Basic Systems (CBS) has endorsed the guidelines proposed by the IPET-CM in consultation with the chairperson of the Open Programme Area Group on Information Systems and Services (OPAG-ISS).

I am confident that the guidelines will be of great help when you plan to introduce WIGOS Station Identifiers in BUFR and CREX messages.

Yours faithfully,

(E. Manaenkova)  
for the Secretary-General

To: Permanent Representatives (or Directors of Meteorological or Hydrometeorological Services) of Members of WMO

cc: Hydrological Advisers to Permanent Representatives

## **Guidelines to introduce the WIGOS Station Identifier in BUFR and CREX messages**

[Where to place]

- (1) When Members report data using BUFR/CREX templates defined in B/C Regulations (Section d, Part C, Volume I.2 of the Manual on Codes) or other BUFR/CREX sequences suitable for reporting specific data sets and include the WSI, the sequence for reporting WSI (3 01 150) should be placed before the BUFR/CREX templates or other BUFR/CREX sequences in BUFR/CREX messages.

The full version of the Manual on Codes and its update with regard to the WSI are available from:

[www.wmo.int/WMOCodes/WMO306\\_vI2/VolumeI.2.html](http://www.wmo.int/WMOCodes/WMO306_vI2/VolumeI.2.html)

[www.wmo.int/WMOCodes/Amendments/2017/fastTrack/FT2017-1\\_en.pdf](http://www.wmo.int/WMOCodes/Amendments/2017/fastTrack/FT2017-1_en.pdf)

[How to encode]

- (2) When Members report data from observation sites that have traditional station identifiers, such as WMO block number (0 01 001)/WMO station number (0 01 002) and buoy platform identifier (0 01 005), they should also be reported in addition to corresponding WSI (3 01 150), to ensure the continuity of data use. On the other hand, the traditional station identifiers should be reported as "missing" when observation sites do not have the traditional identifiers.

[Versions applicable]

- (3) BUFR/CREX messages that include the sequence for reporting WSI (3 01 150) should have master table version number 28 or later, because the sequence 3 01 150 is not defined in the tables with version numbers before 28.

[Advanced notification]

- (4) Members should issue advanced notification at least three months before they start distributing new reports that include both traditional station identifier and WSI (3 01 150), clearly stating the date of change, WSI, corresponding traditional station identifiers (when available), and new and existing bulletin headings. All Members will be notified of these changes through METNO messages defined by the Manual on GTS and as an entry of [Operational Newsletter](#).

[Distribution not parallel]

- (5) Parallel distribution of BUFR/CREX messages with and without WSI (3 01 150), which consists of same contents, is discouraged, as the messages coded in conformity to the practice in (2) above, satisfies user requirements and duplicated reporting of same contents could cause confusion for users.

**PART 2**  
**DUAL-LOCATION OBSERVING STATIONS**



## 2.0 Definition of and U.S. Policy for Dual-Location Stations

For purposes of this document, a *dual-location station* is a fixed-location, land-based observing station for which the same *legacy ID* or *prior non-WMO ID* (as defined in Part 1 of this guide) is or has been used by both a surface synoptic observing site and a rawinsonde (upper air observing) site that are not at the same physical location (not co-located).

The issue for dual-location stations arises when the two observing locations are separated by sufficient horizontal (geographic) distance or vertical distance (difference in elevation) such that the use of location metadata associated with *one* of the physical locations may introduce larger inaccuracies or imprecision into uses of observational data taken at the *other* physical location than if the metadata specifying location accurately reflect the location of each observing site.

For example, consider a rawinsonde launch site that is located 45 km from the synoptic observing site and has an elevation 6 m higher. If the location metadata for the synoptic site are used to assimilate the rawinsonde observations into a numerical weather prediction (NWP) model, the model's output can be altered, compared with an assimilation that used the location metadata specific to the rawinsonde site. The criterion for a difference in location of observing sites at a dual-location station large enough to require different metadata for the observing sites is based on the amount of either vertical (elevation) or horizontal distance that could significantly affect NWP models.

**U.S. Policy for Dual-location Stations.** For dual-location stations within the United States or in U.S territories or under U.S. control, metadata specific to each of the physically separated observing sites shall be provided for WIS-GTS users when the sites differ by an elevation of 3 m or more or by a horizontal distance of 5 km or more. For horizontal distances between observing sites greater than 50 km, different Local Identifier segments shall be used to indicate that the sites are different fixed-location stations.

### 2.1 WMO Past Practice for Differentiating Dual Locations and Current Guidance for Dual-Location Stations with Legacy IDs

Prior to the introduction of WIGOS Station Identifiers (WSIs; see Part 1 of this guide), the World Meteorological Organization (WMO) at times assigned a single five-digit block station number to a dual-location station but permitted the use of a station sub-index number to distinguish the metadata for the surface station from the metadata for the rawinsonde site associated with that station. A sub-index number of 0 (zero) was assigned to the surface station and sub-index number equal to 1 (one) for the rawinsonde launch site. During that time, the metadata for fixed-location land stations were maintained in *Weather Reporting, Volume A: Observing Stations and WMO Catalogue of Radiosonde*, (WMO-No. 9, Vol. A). These sub-index numbers were not incorporated in the code forms used in reporting observing data.

For example, the Rapid City, South Dakota, surface observing site at the regional airport and the rawinsonde launch site for the Rapid City Weather Forecast Office (WFO) both have the WMO-sanctioned block station number (legacy ID) of 72662. Before the WIGOS era, their metadata in

WMO-No. 9, Vol. A were differentiated by sub-index number 0 for the surface observing site and sub-index number 1 for rawinsonde data.

### **WMO Rule for Assigning WSIs for Dual-Location Stations with a Legacy ID**

Under the WMO rules for assigning WSIs to observing stations with WMO-sanctioned block station numbers as of 1 July 2016 (a *legacy ID* station, as defined in Part 1 of this guide), sites with sub-index number = 0 are assigned the Issuer of Identifier segment 20000. Sites with sub-index number = 1 are assigned Issuer of Identifier segment 20001. Thus, the WSIs in the OSCAR/Surface database for the Rapid City, South Dakota, locations are the following:

- Rapid City, SD, Regional Airport (ASOS location): 0-20000-0-72662
- Rapid City, SD, WFO (rawinsonde launch point): 0-20001-0-72662

Note that this assignment of different values for the Issuer of Identifier segment means that dual-location stations can now have a difference in the complete WSI even though the legacy ID (block station number) is used as the Local Identifier segment for both locations.

### **Best Practice for Differentiating Observations at Dual Location Stations with Legacy IDs**

Under the U.S policy stated above, if an observing station that has a legacy ID (e.g., a 5-digit block station number that was WMO-sanctioned and in use prior to 1 July 2016) now has a surface synoptic observing site and rawinsonde release site that differ in location by 5 km or more, up to a difference of 50 km, or when the elevation corresponding to the surface pressure measurement for the surface station and the elevation of the rawinsonde release point differ by 3 m or more, then the station is considered a *dual-location station*. There shall be different WSIs assigned to the two stations, and the metadata for the two locations shall be differentiated in the OSCAR/Surface database.

- When WSIs are used in BUFR messages, then the Issuer of Identifier segment for the surface observing site of a dual-location station with a legacy ID shall be 20000 and the Issuer of Identifier segment for the rawinsonde release point shall be 20001. The Issue Number segment for both locations shall follow WMO guidance per Table 2.2 in the *Guide to WIGOS*. The Local Identifier segment for both locations shall be the legacy ID (block station number).

If the surface observing site and the rawinsonde release point locations differ by 50 km or more, then the two sites shall be identified as separate observing stations. If the two sites DO NOT already have separate legacy IDs (block station numbers) assigned/sanctioned by WMO, then the legacy ID should be retained for the site with the longest time series at the original location and the other site should be assigned a new WSI, as described in Part 1, Section 1.3 of this guide. In practice, this will most often mean that the surface observing site will retain the legacy ID and the upper air site (rawinsonde release location) will move because, for example, the WFO has moved—as happened with the Rapid City, South Dakota, WFO.

In either case (either the station is treated as a dual-location station or the two sites are treated as separate observing stations for data reporting purposes), the elevation of the rawinsonde release point shall be used as the elevation of the rawinsonde location, reflecting the adjustment of the

surface pressure from the baseline station elevation to the release point elevation. Detailed instructions for adjusting for the release point elevation can be found in [NWS Manual 10-1401](#) (2 June 2010), Appendix J, “Station Management.” This appendix includes Table J-1, “Pressure Correction for Difference in Baseline and Release Point Heights.” The RRS [Radiosonde Replacement System] Workstation User Guide also comments on the pressure correction in section 15.2.1, which states that the workstation computes the pressure correction using the barometer height and release point height, which are to be included in the Master Station Data.

## 2.2 Examples of WSI Assignment for Dual-Location Stations with Legacy IDs

**Example 1. Fixed-location Land Station with WMO-sanctioned Block Station Number Becomes a Dual Location Station.** Suppose that a fixed-location land-based station with a 5-digit legacy ID (block station number) is modified such that its surface synoptic observing site and rawinsonde release location are now 20 km apart and differ in elevation by 15 m. The station now meets the criterion for being a dual-location station and must have different metadata in OSCAR/Surface for its two sites.

To make the example more specific, assume the National Weather Service (NWS) Weather Forecast Office (WFO) located at Amarillo International Airport, Amarillo, Texas, relocates its surface synoptic observing site and rawinsonde release location so that they are now 20 km apart and differ in elevation by 15 m. Either of these differences is sufficient to make this a dual-location station requiring separate metadata for the two sites. Since this station had WWW block station number = 72363 prior to 1 July 2016, the following WSIs would be appropriate, if the WMO Secretariat approves use of the Issuer of Identifier segment 20001:

- ASOS surface observing site: 0-20000-0-72363
- Rawinsonde release location: 0-20001-1-72363

Note that the Issue Number for the rawinsonde site is set to “1” because the value “0” is reserved for stations that existed and were reporting data prior to 01 July 2016.<sup>1</sup>

WMO policy is not yet decided on whether the 20001 value can be used in cases such as this or if the Member nation’s Issuer of Identifier code must be used for one of the observing sites. If the surface observing site (for example, an ASOS at the local airport) has not moved a significant distance, so that maintaining continuity in the historical time series for observations is of value, and the WMO does not approve assignment of the 20001 code for the Issuer of Identifier segment, then the NWS could assign the following WSIs to the two observing sites for this WFO:

- ASOS surface observing site (no significant location change): 0-20000-0-72363
- Rawinsonde release location (moved 20 km and elevation change of 15 m): 0-840-700-72363

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<sup>1</sup> See [Guide to WIGOS](#), section 2.4, and especially Table 2.2.

**Note:** For the Issue Number segment of the WSI for the rawinsonde site, this example uses the hypothetical Issue Number allocations shown in Part 1, Figure 1, of this guide.

**Example 2. Surface Observing Site and Rawinsonde Release Point Differ by 50 km or More.**

For this example, assume an observing station has been modified since 1 July 2016 such that the ASOS surface observing location and the rawinsonde release point are now more than 50 km apart. Also assume that the legacy ID of the station prior to the modification was 72471. Further assume that the ASOS location remains unchanged (or changes only slightly so that for purposes of historical data series continuity, the change is not significant). Under these assumptions, the surface observing site (ASOS site) can be considered a “legacy ID” observing station and the new rawinsonde release point is considered a new, different station. If the 5-digit string 72472 has not been assigned, either as a legacy ID (a WMO-sanctioned block station number) or as a Local Identifier at a post-2016 station, the following WSIs would be appropriate:

- ASOS surface observing site (no significant location change): 0-20000-0-72471
- Rawinsonde release location (moved more than 50 km): 0-840-700-72472

However, suppose that the ASOS location also has changed enough that the historical data time series (e.g., for climate monitoring applications) should reflect the discontinuity in metadata. In that case, it is better to treat both of the new locations as new observing stations (see Section 2.3 below). Suppose the 5-digit sequences 72761 and 72762 are not yet assigned as Local Identifier segments but 72xxx numbers are in use as the Local Identifier segment for nearby stations. Then appropriate WSI assignments for these two locations would be:

- ASOS surface observing site (significant location change): 0-840-0-72761
- Rawinsonde release location (located more than more than 50 km from the ASOS site): 0-840-700-72762

### **2.3 Prescribed U.S. Best Practice for Dual-Location Stations without Legacy IDs**

As of 1 May 2020, the WMO requires that if an observing station/platform does not have a WMO-sanctioned ID that was in use prior to 1 July 2016, then a WSI assigned by the cognizant WMO Member country or partner organization shall be used to report data for that station. Under WMO rules for a Member-assigned WSI, the Issuer of Identifier segment shall be the ISSC code for the Member (840 for the United States). See Part 1, Section 1.3 of this guide for details and examples.

Under the procedure for WSI assignment explained in Part 1 of this guide, the Issue Number segment can be used to distinguish, for example, a surface observing site from an upper air observing site, while maintaining the same Local Identifier segment for both sites. The examples below use the same hypothetical Issue Number allocation scheme for the NWS used in Part 1.

When using the Issue Number segment to differentiate observations at a dual-location station, the same distance and elevation criterion applies as for differentiating observations at a dual-location station with a legacy ID (see Section 2.0). Namely:

- If an observing station without a legacy ID has a surface observing site and rawinsonde release site that differ in location by 5 km or more, up to a difference of 50 km, or when the elevation corresponding to the surface pressure measurement for the surface station and the elevation of the rawinsonde release point differ by 3 m or more, then the station is considered a *dual-location station*. The metadata for the two locations shall be differentiated through use of different Issue Number segments in their WSIs, with the Local Identifier segment being the same for both the surface observing data and the upper air (rawinsonde) data.
- If the surface observing site and the rawinsonde release point locations differ by 50 km or more, then the two sites shall be treated as separate observing stations. The two sites shall have distinct Local Identifier segments in their WSIs, as well as having an Issue Number assigned that is in the range reserved for the appropriate type of observation.

In both cases, the elevation of the rawinsonde release point shall be used as the elevation of the rawinsonde location in the metadata, reflecting the adjustment of the surface pressure from the baseline station elevation to the release point elevation. (For references on making this adjustment, see the end of Section 2.1 above.)

**Example 3. Assigning WSIs for a New Dual-Location Station.** Suppose the NWS has a new WFO becoming operational in Montana and its surface observing site at the local airport is located 25 km from the office’s rawinsonde release point. The two locations differ in elevation by 8 m, so either the horizontal distance or the elevation difference is sufficient to meet the criterion for a dual-location station. Also suppose the NWS has adopted the Issue Number assignment schema shown in Figure 1 of Part 1, Section 1.3, so that ASOS observations have an Issue Number in the range 0 to 99 and rawinsondes have Issue Number range 700-799. Finally, assume the NWS is following the guidance in Part 1, Section 1.3, on assigning Local Identifier segments that continue the pattern of similar legacy observing stations and has therefore chosen the unused 5-digit sequence 72771 for the Local Identifier segment. (The Glasgow, Montana, WFO has block station number 72768; the Missoula, Montana, WFO has block station number 72773.)

Under these assumptions, the observing sites at the new WFO will use the following WSIs:

- ASOS surface observation: 0-840-0-72771
- Rawinsonde data: 0-840-700-72771

**Example 4. Assigning WSIs for Observing Locations that Exceed the Dual-Location Criterion.** In the case described in Example 3, assume the distance between the ASOS site and the rawinsonde release point is 52 km instead of 25 km. With this change, the Local Identifier segments for the two locations must differ. Assume the consecutive, unused 5-digit sequences 72761 and 72762 are selected for the Local Identifier segments. So the two observing sites under these assumptions will have these WSIs:

- ASOS surface observation: 0-840-0-72761
- Rawinsonde data: 0-840-700-72762

Note that the Issue Number values still differentiate between observations from the ASOS platform and the radiosonde-derived data.

## **GENERAL APPENDICES**



## GENERAL APPENDIX A ABBREVIATIONS AND ACRONYMS

AMDAR	Aircraft Meteorological Data Relay
AOML	[NOAA] Atlantic Oceanographic and Meteorological Laboratory
ASOS	Automated Surface Observing System
AUV	Autonomous underwater vehicle
BUFR	Binary Universal Form for the Representation of meteorological data
COPC	[OFCM] Committee for Operational Processing Centers
CSAB	[OFCM] Working Group for Cooperative Support and Backup
DBCP	Data Buoy Cooperative Panel (data buoy component of JCOMM)
DOC	U.S. Department of Commerce
DOD	U.S. Department of Defense
DOI	U.S. Department of the Interior
FCMSSR	Federal Committee for Meteorological Services and Supporting Research
FWE	Federal Weather Enterprise
GAW	[WMO] Global Atmosphere Watch
GTS	[WMO] Global Telecommunications Service
<i>Guide to WIGOS</i>	<i>Guide to the WMO Integrated Global Observing System</i> . See Appendix 1.A for the latest edition and a hyperlink to it.
ICAO	International Civil Aviation Organization
ICMSSR	Interdepartmental Committee for Meteorological Services and Supporting Research
ID	[Unique] identifier
IMO	International Marine Organization
IOC	Intergovernmental Oceanographic Commission (component of UNESCO)
ITU	International Telecommunications Union
JCOMM	WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM in situ Observations Programme Support Centre
legacy ID	A WMO-sanctioned observing station identifier allocated to an observing station prior to 1 July 2016. A station identifier that was in use prior to 1 July 2016 but not a WMO-sanctioned ID is called a <i>prior non-WMO ID</i> .
NCEP	[NWS] National Centers for Environmental Prediction
NCO	NCEP Central Operations
NDBC	[U.S.] National Data Buoy Center, an entity within NWS
NOAA	National Oceanic and Atmospheric Administration
NSF	National Science Foundation
NWP	Numeric weather prediction
NWS	[NOAA] National Weather Service
OAR	[NOAA] Office of Oceanic and Atmospheric Research (also called “NOAA Research”)
OFCM	Office of the Federal Coordinator for Meteorological Services and Supporting Research (in NOAA)
OPC	Operational Processing Center

OSCAR	[WMO] Observing Systems Capability Analysis and Review tool
OSCAR/Surface	The database for metadata, including assigned WSIs, of nonsatellite observing stations and platforms accessed with the OSCAR tool. This database includes fixed-location land-based stations, fixed and mobile marine platforms, ships that participate in WMO ocean/atmosphere observing programs, aircraft that transmit AMDAR data, and other observing platforms other than satellites in low-Earth or higher orbits.
prior non-WMO ID	In this guide, an observing station/platform identifier that was in use prior to 1 July 2016 but was not a WMO-sanctioned ID. Compare with <i>legacy ID</i> .
SI	Sub-index number (prior to WIGOS, used in WMO technical documents to distinguish surface observation sites and radiosonde release points that were not co-located. In WIGOS Station Identifiers, legacy IDs with SI = 0 have Issuer of Identifier = 20000; legacy IDs with SI =1 have Issuer of Identifier = 20001)
UNESCO	United Nations Educational, Scientific, and Cultural Organization
URL	Uniform Resource Locator
USAF	United States Air Force
USN	United States Navy
VOS	Voluntary Observing Ship program of the WMO
WFO	NWS Weather Forecast Office
WIGOS	WMO Integrated Global Observing System
<i>WIGOS Manual</i>	<i>Manual on the WMO Integrated Global Observing System: Annex VIII to the WMO Technical Regulation</i> . WMO-No 1160. See Appendix 1.A for the latest edition and a hyperlink to it.
WIR	WIGOS Information Resource
WIS	WMO Information System
WG/OD	[OFCM] Working Group for Observational Data
WMO	World Meteorological Organization
WSI	WIGOS Station Identifier; a 4-component unique identifier for a WIGOS observing station that links the station to its WIGOS metadata
WWW	[WMO] World Weather Watch