

# **Update on MPLNET WMDR XML Files action item, and relation to GALION and other contributing networks**

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1. Process to create and edit existing MPLNET sites (potentially useful for other contributing networks)
2. JSON template and XML file example
3. Summary of status

## Process to maintain MPLNET metadata in OSCAR: specific to API, but many elements the same using OSCAR GUI

1. Download all OSCAR stations related to surface network ops:
  - Developed program to interact with OSCAR API search and upload functions
  - <https://oscar.wmo.int/surface/rest/api/search/station?facilityType=landFixed,landMobile,landOnIce,seaFixed,seaMobile,seaOnIce,lakeRiverFixed,lakeRiverMobile>
  - Compare with existing MPLNET sites and match based on co-location within 1 km lat/lon
    - Separate results into match-affiliated (9), match-not-affiliated (20), and no match (station must be created in OSCAR, 44)
  - Input results to JSON template
2. Develop new JSON template to contain MPLNET metadata required in OSCAR
  - Designed for use by other networks as well
  - Scour OSCAR code lists and requirements to fill required elements, insert NULL for fields where needed
  - Include status of MPLNET-OSCAR program affiliation
  - Modify internal MPLNET database to fill and maintain this template in cronjob
3. Develop program to read JSON template and create XML files for all MPLNET sites
  - Construction of XML file depends on MPLNET-OSCAR affiliation status
  - If station is new (not in OSCAR), then XML file creation is quite simple. However, cannot create new station right now.
  - If station exists in OSCAR, but is not yet affiliated then XML file is also quite simple to create. Can upload in API and modify station.
  - If station exists in OSCAR, and is already affiliated then the XML file creation is very complicated.
    - Right now 9 existing stations have out-of-date information that must be edited, and also many new observations must be added.
    - Very difficult process figuring out how to edit existing information using the API.
    - Summary: at moment only one remaining issue (last slide)
4. Save XML files and templates in web accessible directory for easy access, upload using OSCAR API

# NASA WMDR JSON Template: V2

- Three sections
    - Header
    - Help
    - Sites (list)
    - 4<sup>th</sup> section called NOTES not shown
  - Goals
    - Assist contributing networks interactions with OSCAR using API
    - Simplify collection of information needed to create and edit WMDR XML files using API
    - Include important information not already in WMDR
  - Required Sections
    - Header
    - Sites
- ```

    },
    "SITES": [
      {
        "WIGOS_SITE": "Goddard (MD)",
        "WIGOS_SITE_ID": "00-20000-0-GSFC",
        "WMO_SITE_ID": "161",
        "WIGOS_SITE_TYPE": "LandFixed",
        "WIGOS_SITE_REGION": "NorthCentralAmericaCaribbean",
        "WIGOS_SITE_TERRITORY": "USA",
        "WIGOS_SITE_LOCATION": "38.993888 -76.839996 50.0",
        "SITE_LAT_LON_DIFF_KM": [0.300, 0.999],
        "SITE_WEBSITE": "",
        "PROGRAM": "MPLNET",
        "PROGRAM_SITE": "GSFC",
        "PROGRAM_WEBSITE": "https://mplnet.gsfc.nasa.gov",
        "PROGRAM_CONTACT": "Melton, Ellsworth J., Dr.",
        "PROGRAM_CONTACT_EMAIL": "jmelton@gsfc.nasa.gov"
      }
    ]
  }
}

```

[illegible]



# NASA WMDR JSON Template V2: Header and Help Sections

```
{
  "HEADER": {
    "WMDR_TEMPLATE": "NASA",
    "WMDR_TEMPLATE_VERSION": 2,
    "WMDR_TEMPLATE_AUTHOR": "Ellsworth J. Welton",
    "WMDR_TEMPLATE_AUTHOR_EMAIL": "ellsworth.j.welton@nasa.gov",
    "WMDR_TEMPLATE_ONLINE_HELP": "https://mplnet.gsfc.nasa.gov/galion/wigos_template_tutorial.htm",
    "WMDR_VERSION": "1.0RC9",
    "NUMBER_OF_SITES_IN_FILE": 1
  },
  "HELP": {
    "WHAT_TO_DO": "add each of your sites to the SITES list below, as a json block { ... }. Put a comma after each }, except the last one. Name this json file: wmdr_PROGRAM-NAME_template.json",
    "WIGOS_SITE": "Name of site in OSCAR/WIGOS",
    "WIGOS_SITE_ID": "Station ID in WIGOS",
    "WMO_SITE_ID": "OPTIONAL: Station ID in WMO/Internal",
    "WIGOS_SITE_TYPE": "OPTIONAL: notation value from code registry http://codes.wmo.int/wmdr/FacilityType/",
    "WIGOS_SITE_REGION": "notation value from code registry http://codes.wmo.int/wmdr/WMORegion/",
    "WIGOS_SITE_TERRITORY": "notation value from code registry http://codes.wmo.int/wmdr/TerritoryName/",
    "WIGOS_SITE_LOCATION": "Site coordinates in scalar string with spaces between values: Digital_Latitude Digital_Longitude Site_Elevation_Meters",
    "SITE_LAT_LON_DIFF_KM": "OPTIONAL: Two element float array containing difference in km between WIGOS station and Program station [Lat_Diff, Lon_Diff]",
    "SITE_WEBSITE": "OPTIONAL: URL for facility/site website, not program (this may be host institution website)",
    "PROGRAM": "name of your program, must be from code registry http://codes.wmo.int/wmdr/ProgramAffiliation/",
    "PROGRAM_SITE": "program specific site name",
    "PROGRAM_WEBSITE": "OPTIONAL: (strongly recommended) URL for program website",
    "PROGRAM_CONTACT": "program point of contact, format: SURNAME,FIRST_NAME MI,SALUTATION(Dr.,Mr.,Mrs.,Ms.,etc). Example: Welton, Ellsworth J.,Dr.",
    "PROGRAM_CONTACT_EMAIL": "program contact email address",
    "PROGRAM_CONTACT_INSTITUTION": "institution of program contact",
    "PROGRAM_CONTACT_ADDRESS": "program contact street address",
    "PROGRAM_CONTACT_CITY": "program contact city",
    "PROGRAM_CONTACT_POSTAL_CODE": "program contact postal code",
    "PROGRAM_CONTACT_COUNTRY": "program contact country",
    "PROGRAM_CONTACT_PHONE": "OPTIONAL: program contact voice phone number",
    "PROGRAM_CONTACT_ROLE": "role of program contact, suggest principalInvestigator, but must be one from code registry https://standards.iso.org/iso/19115/resources/CodeLists/gml/CI_RoleCode.xml",
    "PROGRAM_AFFILIATION": "0 if not affiliated yet, 1 if affiliated",
    "PROGRAM_STATUS": "notation value from code registry http://codes.wmo.int/wmdr/ReportingStatus/ ",
    "PROGRAM_START_DATE": "date/time program observations began at this site, use ISO string format: YYYY-MM-DDTHH:MM:SSZ",
    "PROGRAM_END_DATE": "date/time program observations ended at this site, use ISO string format: YYYY-MM-DDTHH:MM:SSZ. If ongoing, then leave as blank string",
    "OBSERVATION_VARIABLE": "string array containing all observation variables available, notation values from code registry http://codes.wmo.int/wmdr/ObservedVariableNAME/, where NAME is one of Atmosphere, Earth, Ocean, OuterSpace, Terrestrial. Note: all",
    "OBSERVATION_VARIABLE_DESCRIPTION": "OPTIONAL: corresponding string array containing descriptions from the code registry http://codes.wmo.int/wmdr/ObservedVariableNAME/",
    "OBSERVATION_GEOMETRY": "corresponding string array containing notation values from code registry http://codes.wmo.int/wmdr/Geometry",
    "OBSERVATION_APPLICATION_AREA": "OPTIONAL (strongly recommended): corresponding string array containing notation value from code registry http://codes.wmo.int/wmdr/ApplicationArea. Determine correct areas for observed variable from https://www.wmo-sat",
    "OBSERVATION_INSTRUMENT": "corresponding string array containing notation value from code registry http://codes.wmo.int/wmdr/ObservingMethodAtmosphere/",
    "OBSERVATION_INSTRUMENT_DESCRIPTION": "OPTIONAL: corresponding string array containing descriptions from the code registry http://codes.wmo.int/wmdr/ObservingMethodAtmosphere/",
    "OBSERVATION_DATA_LEVEL": "corresponding string array containing notation value from code registry http://codes.wmo.int/wmdr/LevelOfData/",
    "OBSERVATION_DATA_POLICY": "corresponding string array containing URL for program data policy. NOTE: There is a code registry http://codes.wmo.int/wmdr/DataPolicy, however it is not applicable for non WMO programs/projects so I am ignoring it",
    "OBSERVATION_SCHEDULE": "corresponding string array containing the schedule of observation (see https://schemas.wmo.int/wmdr/1.0RC9/documentation/schemadoc/wmdr.html#Link62). For each observation variable include a string 'startMonth;endMonth;startWeek",
    "OBSERVATION_LAYER": "OPTIONAL (strongly recommended for GALION): corresponding string array containing atmospheric layers applicable to observed variable, acceptable values PBL FT UTLS MUS. If more than one layer per observed variable then use ; to separate",
    "OBSERVATION_WAVELENGTH": "OPTIONAL: corresponding cstring array containing wavelength of observed variable (if applicable)",
    "OBSERVATION_FREQUENCY": "OPTIONAL: corresponding string array containing frequency of observed variable (if applicable)",
    "OBSERVATION_VARIABLE_UNIT": "OPTIONAL: corresponding string array containing units of the observed variable. Choose from the code registry http://codes.wmo.int/wmdr/unit (NOTE: no 'unknown' value, so put missing_in_oscar if cannot find your unit)",
    "OBSERVATION_WAVELENGTH_UNIT": "OPTIONAL: corresponding string array containing units of wavelength of observed variable (if applicable). Choose from m, um, nm",
    "OBSERVATION_FREQUENCY_UNIT": "OPTIONAL: corresponding string array containing units of frequency of observed variable (if applicable). Choose from Hz, kHz, MHz, GHz, THz",
    "OBSERVATION_DISTRIBUTION_URL": "OPTIONAL (strongly recommended): corresponding string array containing URL/API to download data of observed variable. If more than one URL/API per observed variable use ; to separate",
    "OBSERVATION_DISTRIBUTION_DESCRIPTION": "OPTIONAL (strongly recommended): corresponding string array containing description of the URL/APIs. If more than one URL/API per observed variable use ; to separate",
    "OBSERVATION_DISTRIBUTION_FORMAT": "OPTIONAL (strongly recommended): corresponding string array containing the file format of the downloaded data from the URL/APIs. If more than one URL/API per observed variable use ; to separate"
  }
}
```



## NASA WMDR JSON Template V2: Sites Section (Example showing GSFC MPLNET site)

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## Header and Observing Facility

## Creation of XML Files to upload to OSCAR

- The status of MPLNET-OSCAR affiliation determines the content
- Namely whether information is being added or modified.
  - GML IDs must be considered and used appropriately
- In addition, elements that are not being added or modified cannot just be missing in the XML file.
  - One must know the correct way to include what is essentially a “blank” entry
  - Discovering this process was difficult and time consuming, all trial and error and inspecting the API json response for errors etc..
- Handling elements with time/date was especially difficult, again it was trial and error at first, and then asking for someone to show me how to do this properly. OSCAR API only checks XML syntax not necessarily whether you used the correct logic
  - Example: I was successfully uploading an XML file with edits, but the resulting change in OSCAR was incorrect
- NOTE: I cannot fit one observation element on this slide, so only header and Observing facility are shown as example

# Header and Observer

# Summary of Status

After **MUCH** effort and back and forth communication with OSCAR staff:

- I can create XML files for new stations to add to OSCAR
  - But due to issues with WIGOS ID management, there is no easy way to create them in OSCAR
- I can create XML files for existing MPLNET sites in OSCAR, and add/modify program affiliations
  - Its unclear if this capability is open to all since permissions with OSCAR accounts may still be a problem?
- Editing existing observation elements still has problems
  - Updating time/date periods in observation element does not work properly

A new version of OSCAR is being released with new logic and more GML IDs:

- This may negate much of the processing code I already developed, not sure yet
- Also not sure whether new release will be more or less complicated than existing
  - But more GML IDs will definitely complicate the process of creating XML files to upload

There remain many problems and/or errors with existing OSCAR code lists and requirements that I have documented already

- Some are being addressed, but most appear not to be

Biggest problem by far remains lack of good help/tutorial system to use OSCAR and add/update metadata

Question: after all my effort I still cannot maintain my sites in OSCAR, now the system is changing despite key issues not being addressed yet.

- Why should I or any contributing network put such effort into this? Who is using this information and why?
  - Who is the primary user of OSCAR? What are their requirements/needs? Does OSCAR meet them?
  - If OSCAR crashed and went down tomorrow, what is the impact?
  - Does OSCAR affect actual data content within WMO applications?