Generate WIS2 Metadata

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Agenda

- **Generating Metadata with the wis2box GUI**
  - We'll begin with a brief overview of how to create metadata using the wis2box GUI, followed by a look at the generated metadata.

Hands-on

- **Generating Metadata with an Excel Macro**
  - Participants will create metadata using an Excel macro.
- **Review and Validation of the Generated Metadata**
  - We'll review the generated metadata and validate it using available tools.

Objective

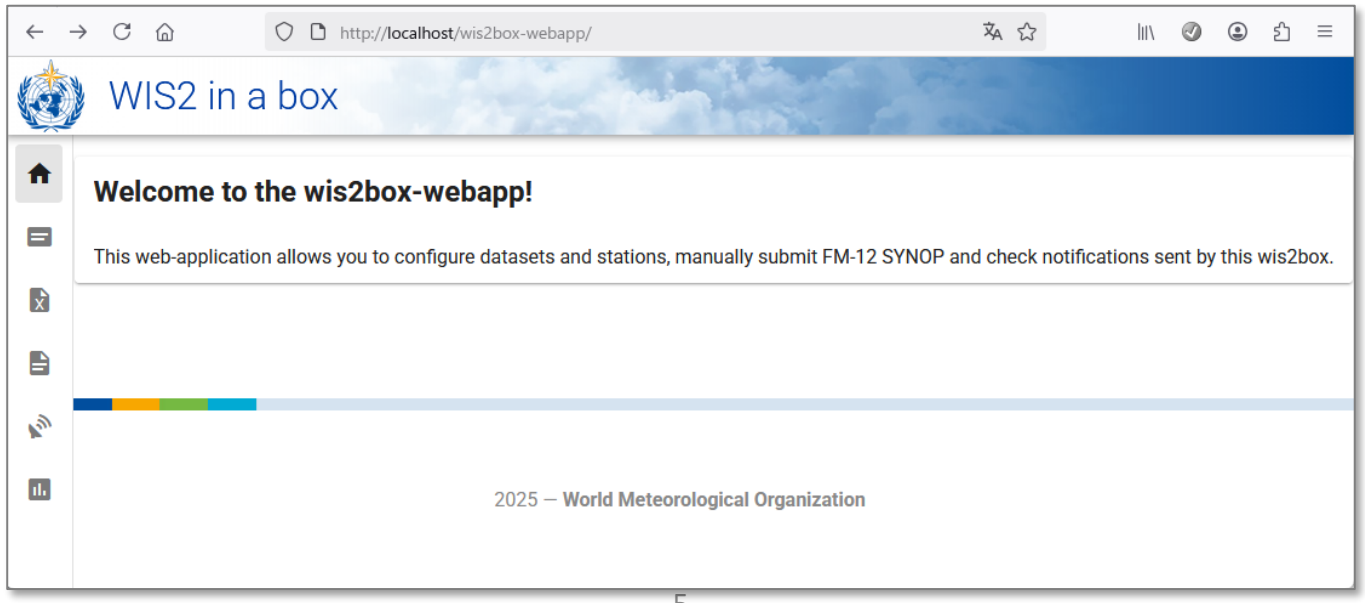
- Goal: Have participants try generating metadata using an Excel macro to gain a deeper and more practical understanding of metadata structure and fields.

- Benefits of the Excel-macro exercise
  - Expose hidden structure: While wis2box's GUI makes metadata creation fast and easy, using an Excel macro reveals the underlying fields, rules, and choices that the GUI conceals.
  - Practical mastery of requirements: The hands-on macro workflow deepens understanding of required attributes and conventions such as Centre ID, Local ID, WMO Data Policy, Temporal Properties, and Keywords.

Generating Metadata with the wis2box GUI

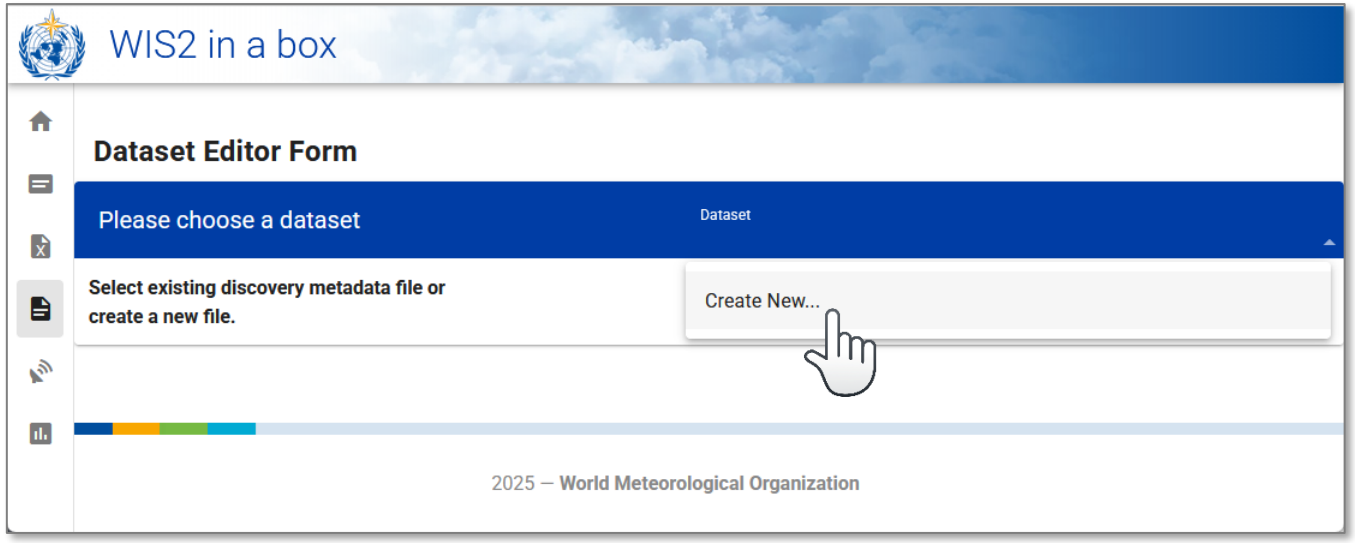
Generating Metadata with the wis2box GUI

1. Install wis2box
   – Follow the installation and configuration steps in the official setup guide. https://docs.wis2box.wis.wmo.int/en/1.1.0/user/setup.html
2. Access the wis2box web application
   – Open the wis2box web frontend in a browser at the URL you configured for your instance.



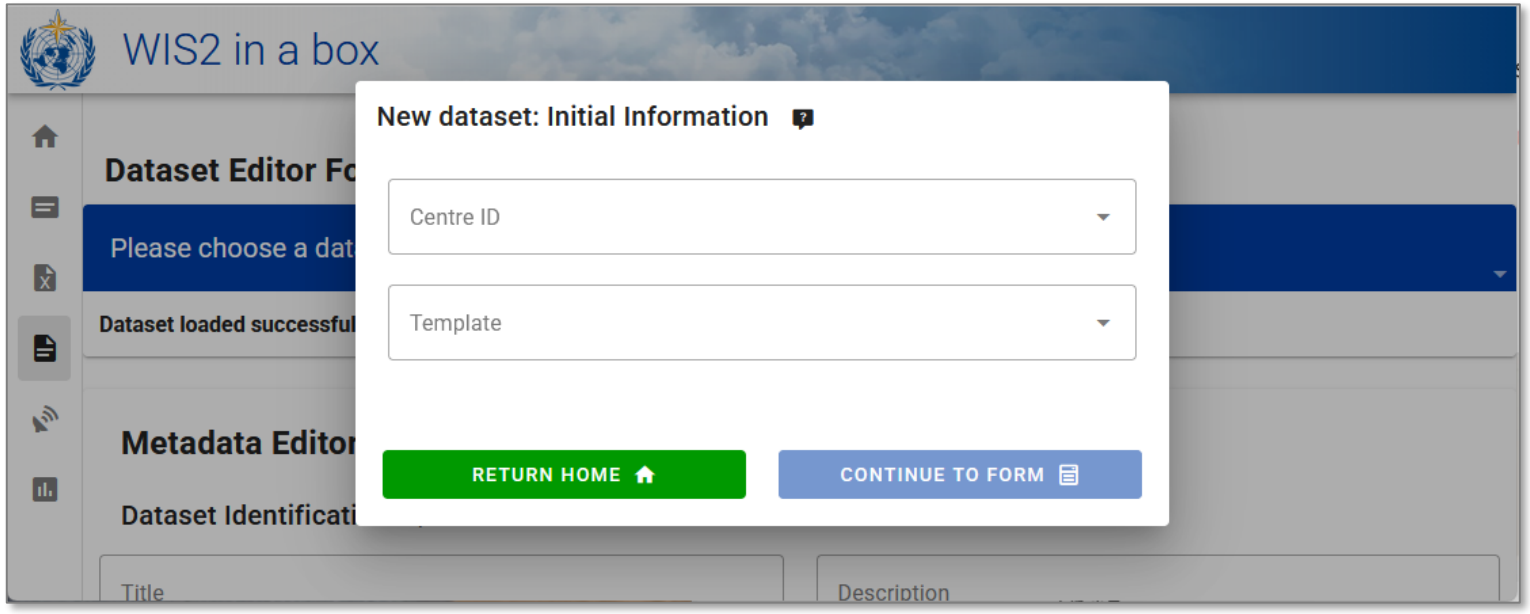
Generating Metadata with the wis2box GUI

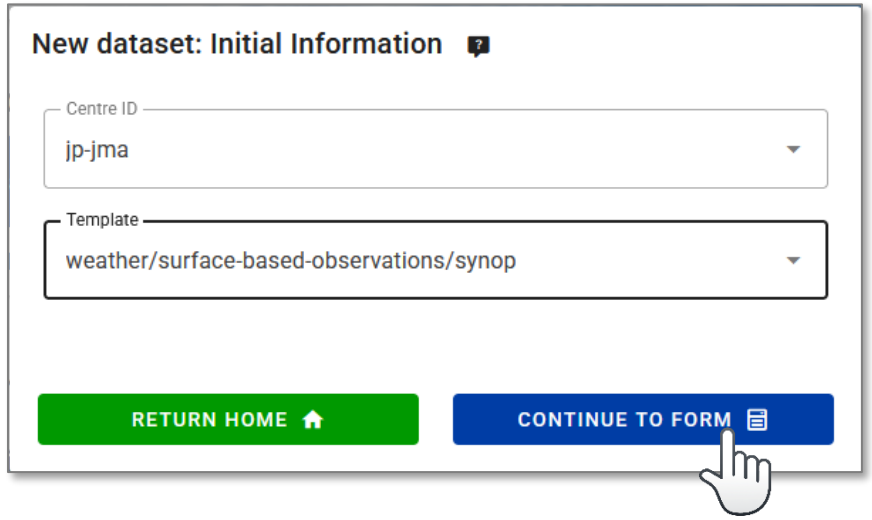
3. Select **Dataset Editor**.
4. From **Dataset**, choose **Create New....**



Generating Metadata with the wis2box GUI

5. Enter the **Centre ID** and select a **Template**.
   - The centre-id should start with the ccTLD (Country Code Top Level Domain) of your country, followed by a dash (-) and an abbreviated name of your organization, for example jp-jma.

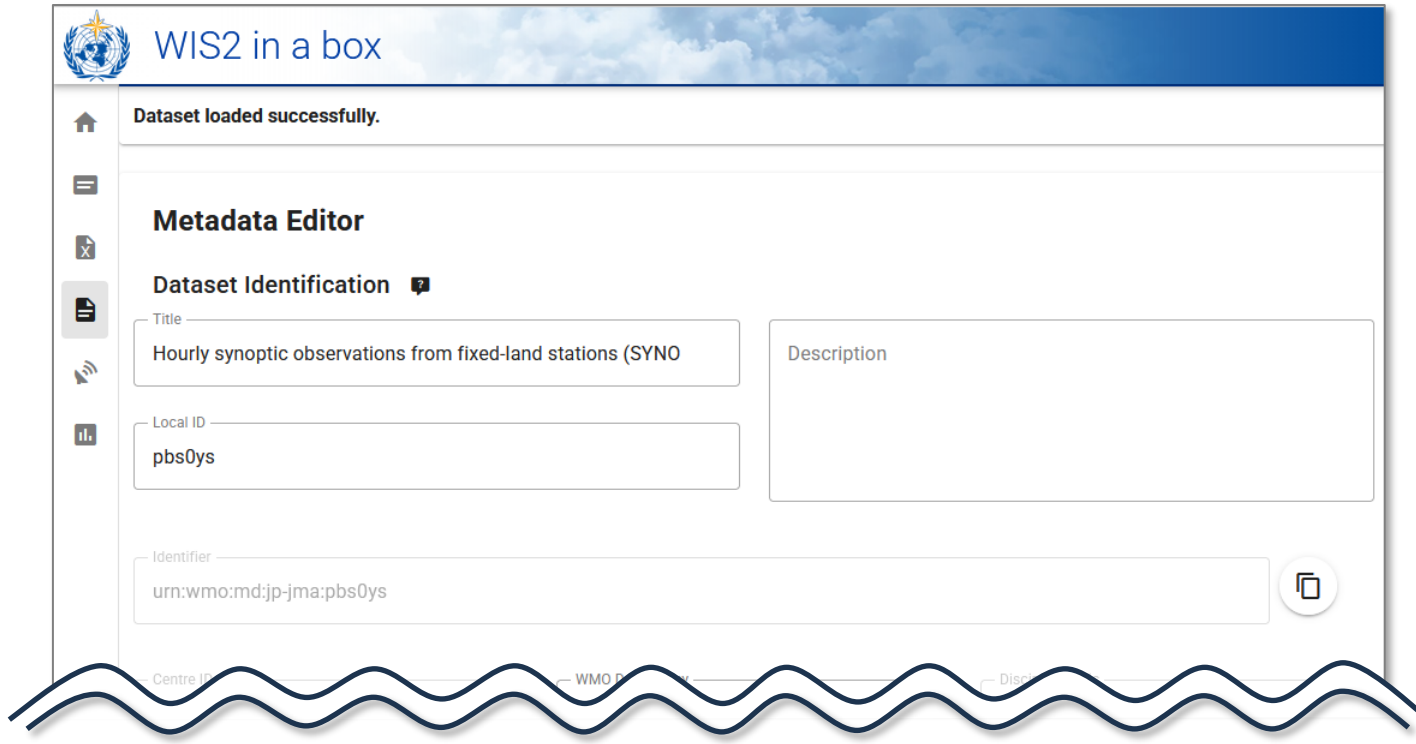




Generating Metadata with the wis2box GUI

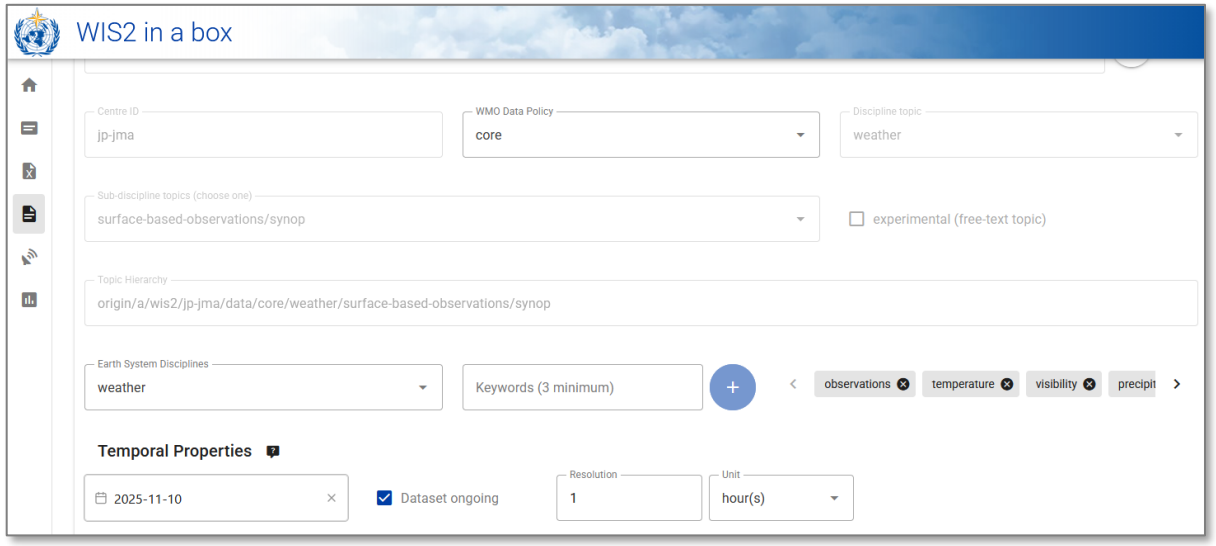
6. The Metadata Editor opens

- 6.1 The **Title** is filled automatically based on the chosen template.
- 6.2 The **Local ID** should be unique within your centre.
  - A random string is provided by default; replace it with a human-readable identifier (for example, **synop**) for easier recognition.
- 6.3 Description
  - Use the **Description** field to write details about the dataset.



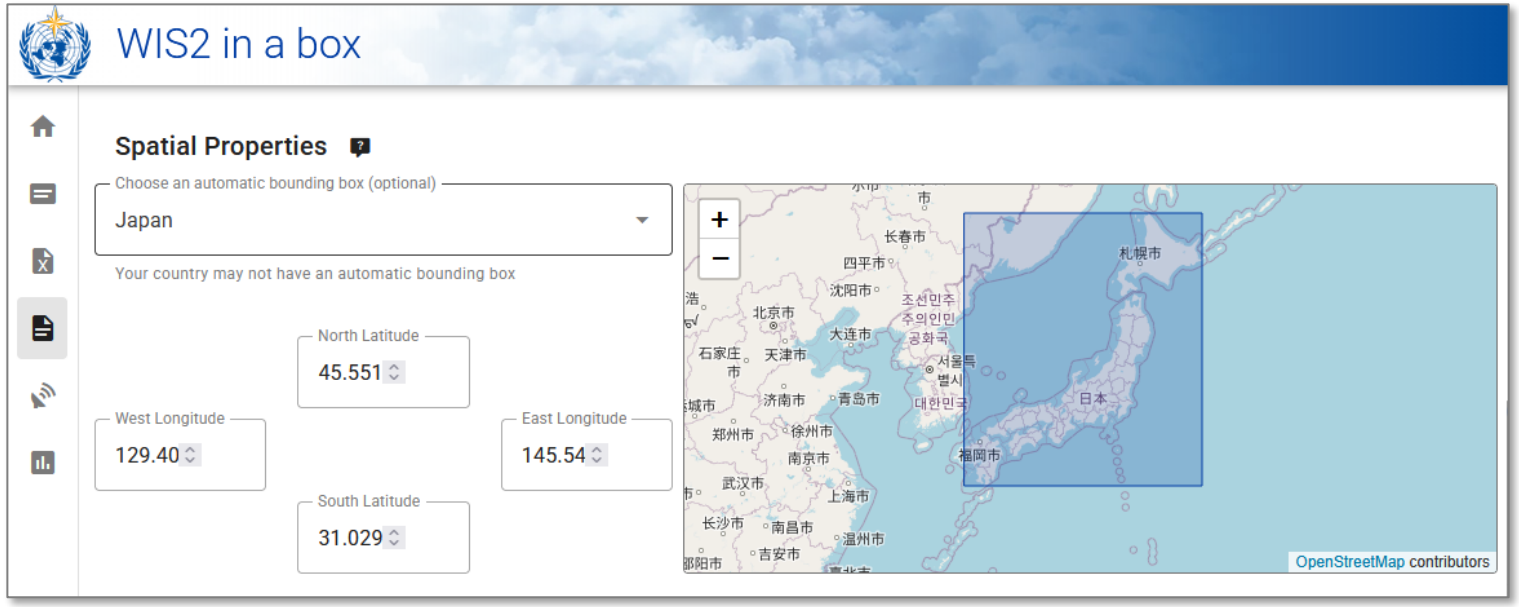
Generating Metadata with the wis2box GUI

- 6.4 WMO Data Policy
  - Choose the **WMO Data Policy** setting: either **core** or **recommended**.
- 6.5 The **Earth System Disciplines** field is pre-filled with **weather** according to the selected template.
- 6.6 **Keywords** are also populated with default values.
- 6.7 **Temporal Properties** are set to today's date and a duration of **1 hour(s)**.



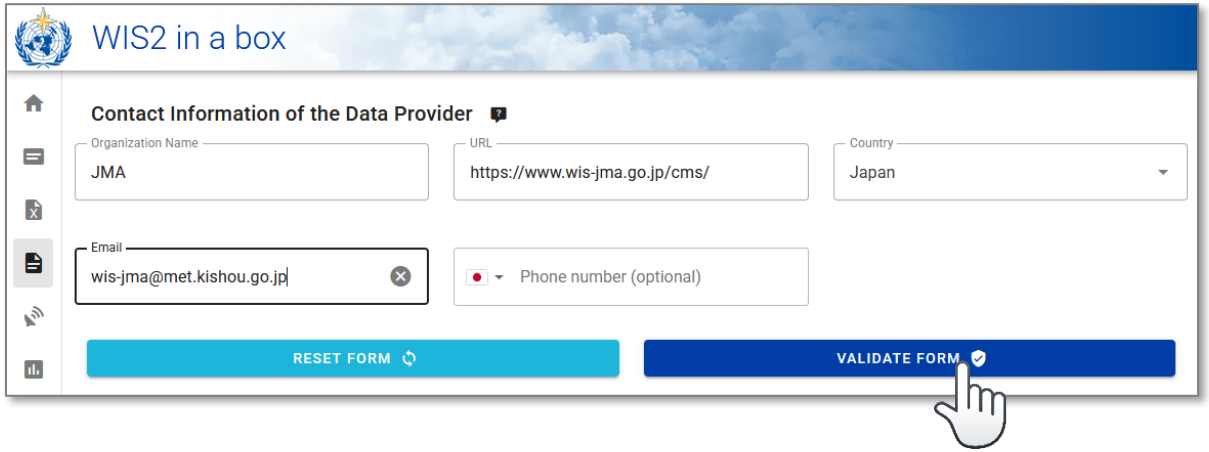
Generating Metadata with the wis2box GUI

- 6.8 Spatial Properties
  - When a country is selected, the west/east/south/north bounding coordinates are set automatically; these defaults may not always be appropriate.

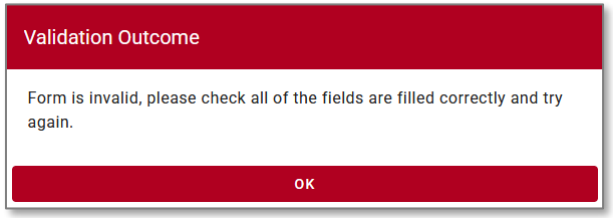


Generating Metadata with the wis2box GUI

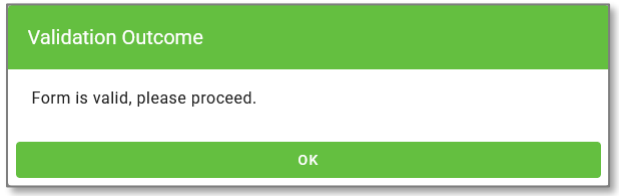
- 6.9 Contact Information of the Data Provider



- 6.10 Click **VALIDATE FORM** to check the entered values for errors or missing required fields

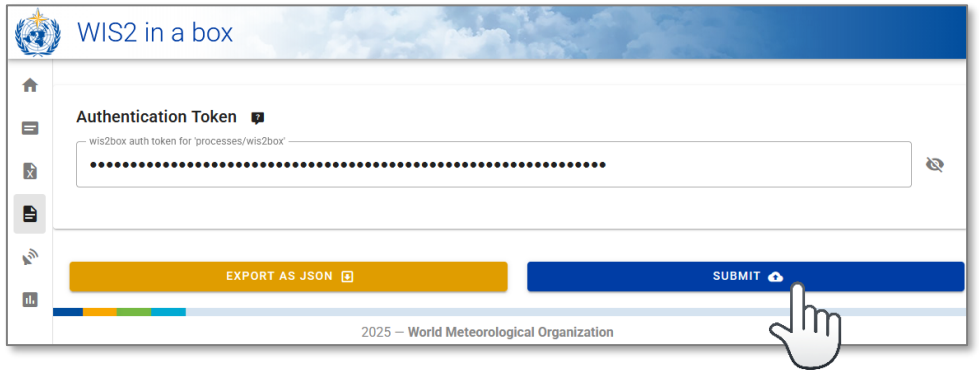


or

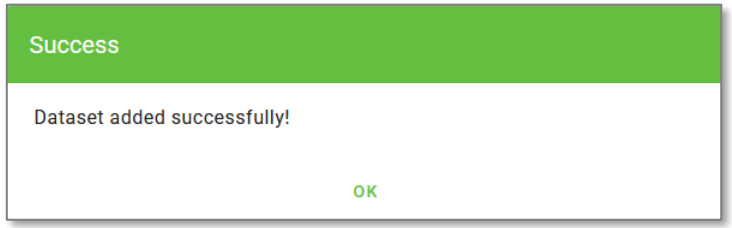


Generating Metadata with the wis2box GUI

- 6.12 **Authentication Token** is a random secret used by wis2box to control access to protected API endpoints.



- 6.13 Click **SUBMIT** to register the metadata.



Generated metadata

- {"id": "urn:wmo:md:jp-jma:synop", "conformsTo": ["http://wis.wmo.int/spec/wcmp/2/conf/core"], "type": "Feature", "time": {"interval": ["2025-11-19", ".."], "resolution": "PT1H"}, "geometry": {"type": "Polygon", "coordinates": [[[129.40846316947255, 45.55148346616134], [145.5431372418027, 45.55148346616134], [145.5431372418027, 31.029579169228246], [129.40846316947255, 31.029579169228246], [129.40846316947255, 45.55148346616134]]]}, "properties": {"type": "dataset", "identifier": "urn:wmo:md:jp-jma:synop", "title": "Hourly synoptic observations from fixed-land stations (SYNOP) (jp-jma)", "description": "Hourly synoptic observations from fixed-land stations (SYNOP) (jp-jma) ", "keywords": ["observations", "temperature", "visibility", "precipitation", "pressure", "clouds", "snow depth", "evaporation", "radiation", "wind", "total sunshine", "humidity"], "themes": [{"concepts": [{"id": "weather", "title": "Weather"}], "scheme": "https://codes.wmo.int/wis/topic-hierarchy/earth-system-discipline"}], "contacts": [{"organization": "JMA", "emails": [{"value": "wis-jma@met.kishou.go.jp"}], "addresses": [{"country": "JPN"}], "links": [{"rel": "about", "href": "https://www.wis-jma.go.jp/cms/", "type": "text/html"}], "roles": ["host"]}], "created": "2025-11-19T00:13:53Z", "updated": "2025-11-19T00:24:55Z", "wmo:dataPolicy": "core", "id": "urn:wmo:md:jp-jma:synop"}, "links": [{"href": "mqtt://everyone:everyone@localhost:1883", "type": "application/json", "name": "jp-jma/data/core/weather/surface-based-observations/synop", "rel": "items", "channel": "jp-jma/data/core/weather/surface-based-observations/synop", "title": "Notifications"}]}

Generated metadata

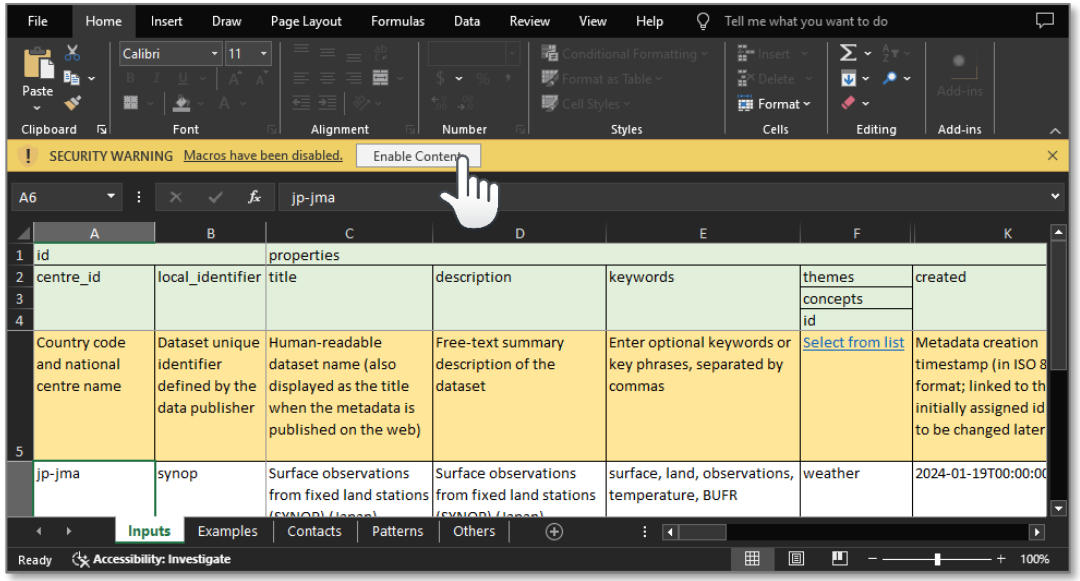
- The metadata produced by the wis2box is compacted.
- Using Excel, pretty-print the JSON with indentation, and provide inline annotations that explain each field and value.
  - **JMA-WS2025_item08_metadataExample.xlsx**

	A	B	
1	WCMP2 record	Requirement	Description
2	{		
3	"id": "urn:wmo:md:jp-jma:synop",	Required	A unique identifier of the datase
4	"conformsTo": [	Required	The version of WCMP to which t
5	"http://wis.wmo.int/spec/wcmp/2/conf/core"		
6	],		
7	"type": "Feature",	Required	A fixed value denoting the WCM
8	"time": {	Required	Temporal extent
9	"interval": [	Not required; it can also be	
10	"2025-11-10",	specified as **"time": null** or using	
11	".."	a **"time": {"Date":** value instead.	
12	],		
13	"resolution": "PT1H"	Optional	
14	},		
15	"geometry": {	Required	geospatial extent
16	"type": "Polygon",	Not required; it can also be	
17	"coordinates": [	specified as **"geometry": null** or	

Generating Metadata with an Excel Macro

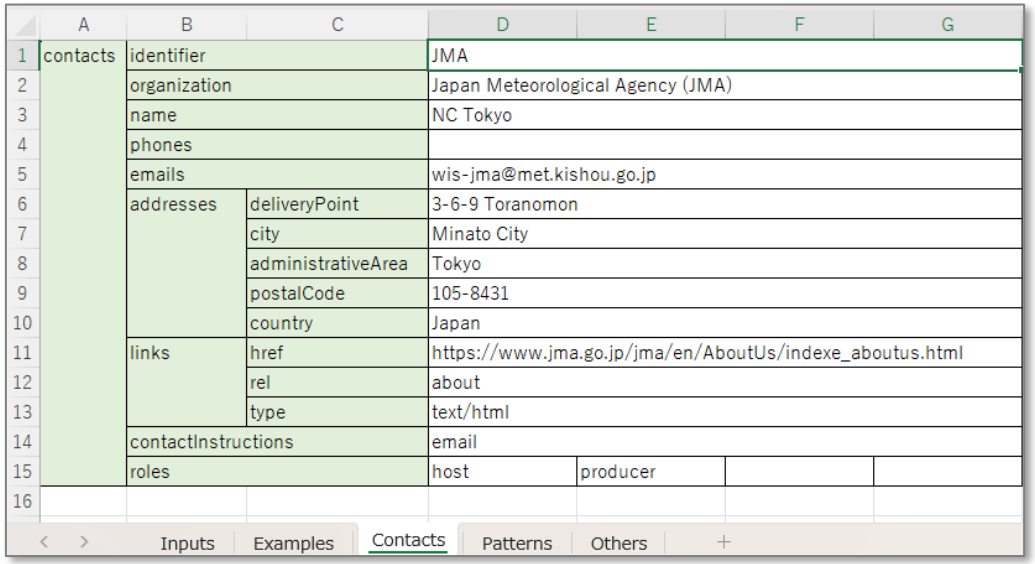
Generating Metadata with an Excel Macro

- Please open **JMA-WS2025_item08_metadataGenerator.xlsm**
  - The Excel file has been placed on your desktop in advance, so please open it. (Alternatively, if you're participating online, please download the file. Since we'll be running a macro, you'll need to have the file on your local machine.)
  - A Security Warning may appear; if it does, please trust this file and click **Enable Content** to activate the macro.



Generating Metadata with an Excel Macro

- The **Others** sheet contains fixed values and does not need to be changed.
- The **Patterns** sheet lists fields where you choose a value from a predefined vocabulary.
- The **Contacts** sheet currently contains JMA entries.
  - It includes more granular settings than wis2box requires, but those extra settings are optional.



	A	B	C	D	E	F	G
1	contacts	identifier		JMA			
2		organization		Japan Meteorological Agency (JMA)			
3		name		NC Tokyo			
4		phones					
5		emails		wis-jma@met.kishou.go.jp			
6		addresses	deliveryPoint	3-6-9 Toranomon			
7			city	Minato City			
8			administrativeArea	Tokyo			
9			postalCode	105-8431			
10			country	Japan			
11		links	href	https://www.jma.go.jp/jma/en/AboutUs/indexe_aboutus.html			
12			rel	about			
13			type	text/html			
14		contactInstructions		email			
15		roles		host	producer		
16							

Inputs | Examples | Contacts | Patterns | Others

Generating Metadata with an Excel Macro

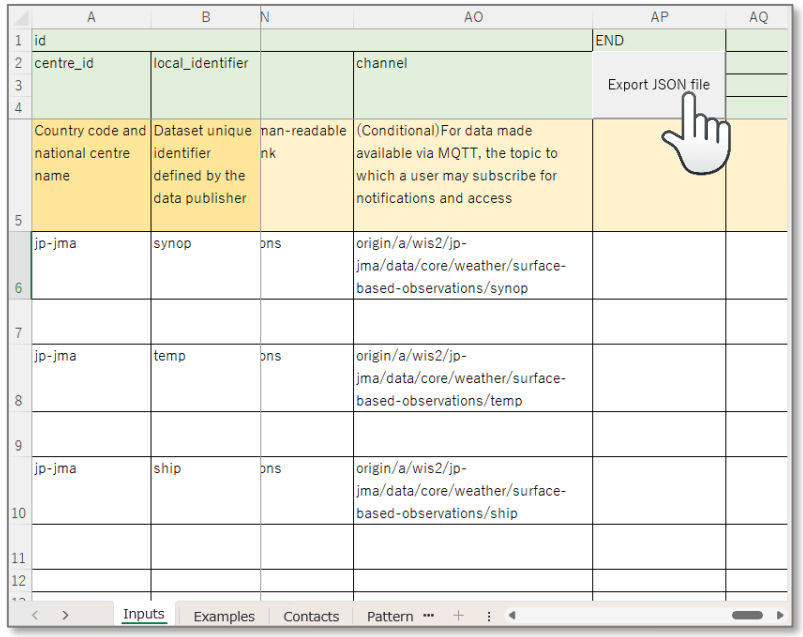
- The **Inputs** and **Examples** sheets contain sample data for creating metadata.
- The **Examples** sheet explains how each field should be filled in.
- The **Inputs** sheet already contains values to create three jp-jma metadata records.
  - Note: This is only a sample and the actual values may differ slightly.
- Let's take a look at the values entered in the **Examples** sheet.

Generating Metadata with an Excel Macro

- The **centre_id** should start with the ccTLD (Country Code Top Level Domain) of your country, followed by a dash (-) and an abbreviated name of your organization, for example jp-jma.
- The **lical_identifier** is defined by the data publisher.
- The **properties.themes.concepts.id** should be one of the seven high-level categories defined by the WMO Unified Data Policy.
  - https://codes.wmo.int/wis/topic-hierarchy/_earth-system-discipline
- ……

Generating Metadata with an Excel Macro

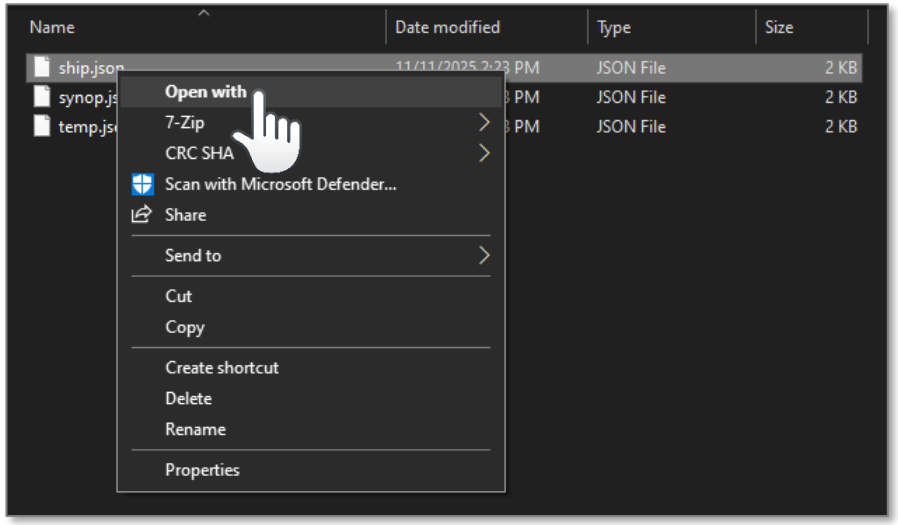
- Now generate metadata using the values in the **Inputs** sheet.
  - Use the pre-filled data for this run.
  - This example will produce metadata for synop, temp, and ship.
- Click the **Export JSON file** button at the far right to write the JSON files to the **output_metadata** folder.

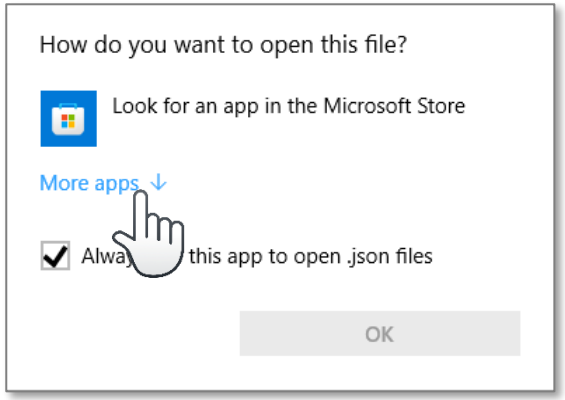


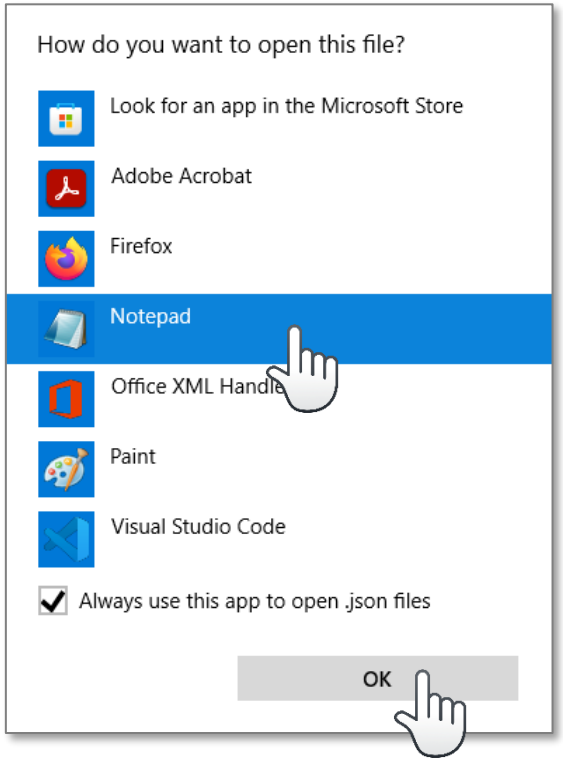
Review and Validation of the Generated Metadata

Review and Validation of the Generated Metadata

- Open the generated JSON file in Notepad to inspect its contents.







Review and Validation of the Generated Metadata

- The generated JSON has no line breaks.
- Enable **Word Wrap** on the **Format** menu to view the entire file.

Review and validation of the generated metadata

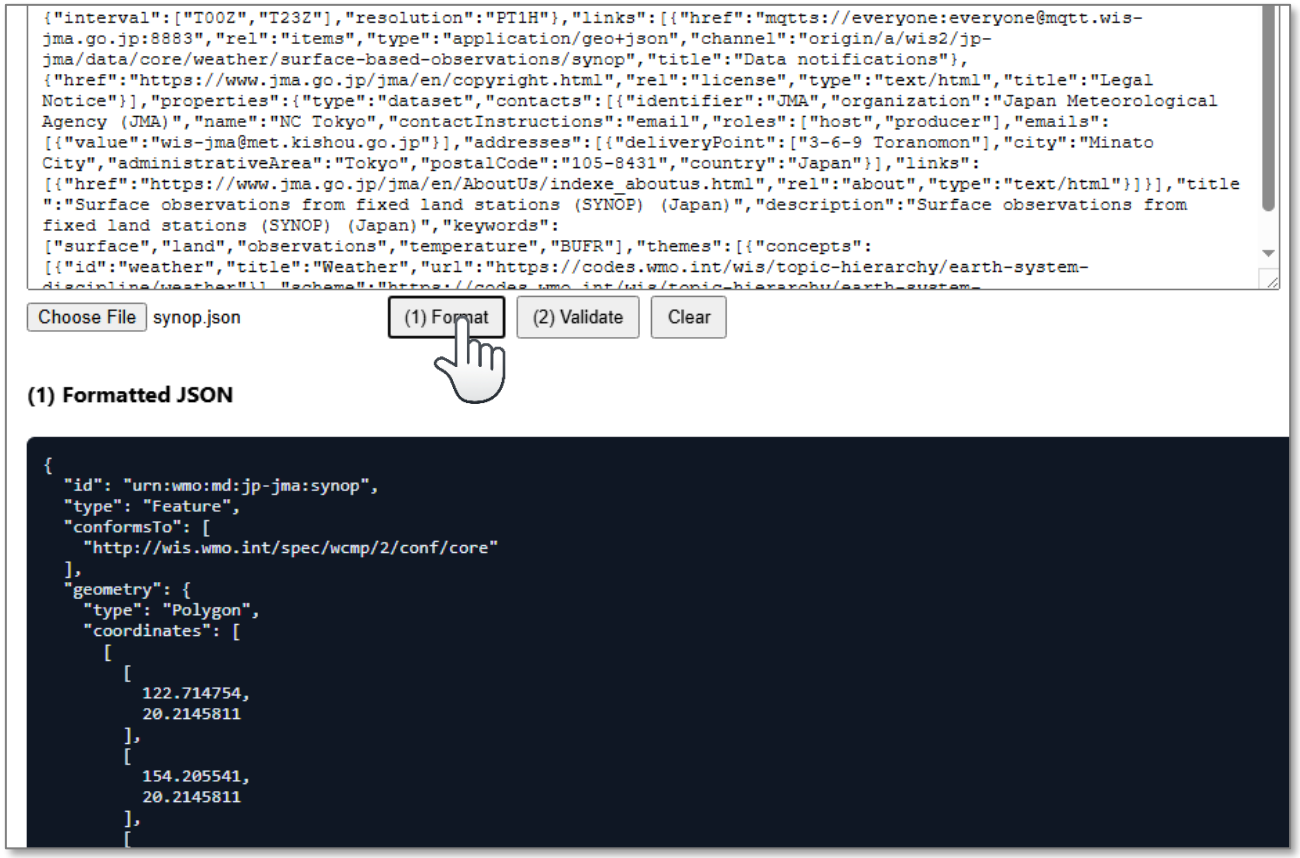
- If you have access to a Linux environment (WSL is also fine), you can easily pretty-print the JSON files using **`jq`** command.

Review and Validation of the Generated Metadata

- Installing the **`jq`** command is straightforward, but preparing a Linux environment requires downloading many packages and can take some time.
- For quick checks during this course, a web page for formatting JSON has been provided:
  - *A URL was originally included here; however, the webpage was temporary and is no longer accessible.*
- Note that this web page is temporary and has been set up **only for the duration of the workshop**.

Review and Validation of the Generated Metadata

- Paste your JSON or choose a file, then click **(1) Format** to display the formatted JSON.

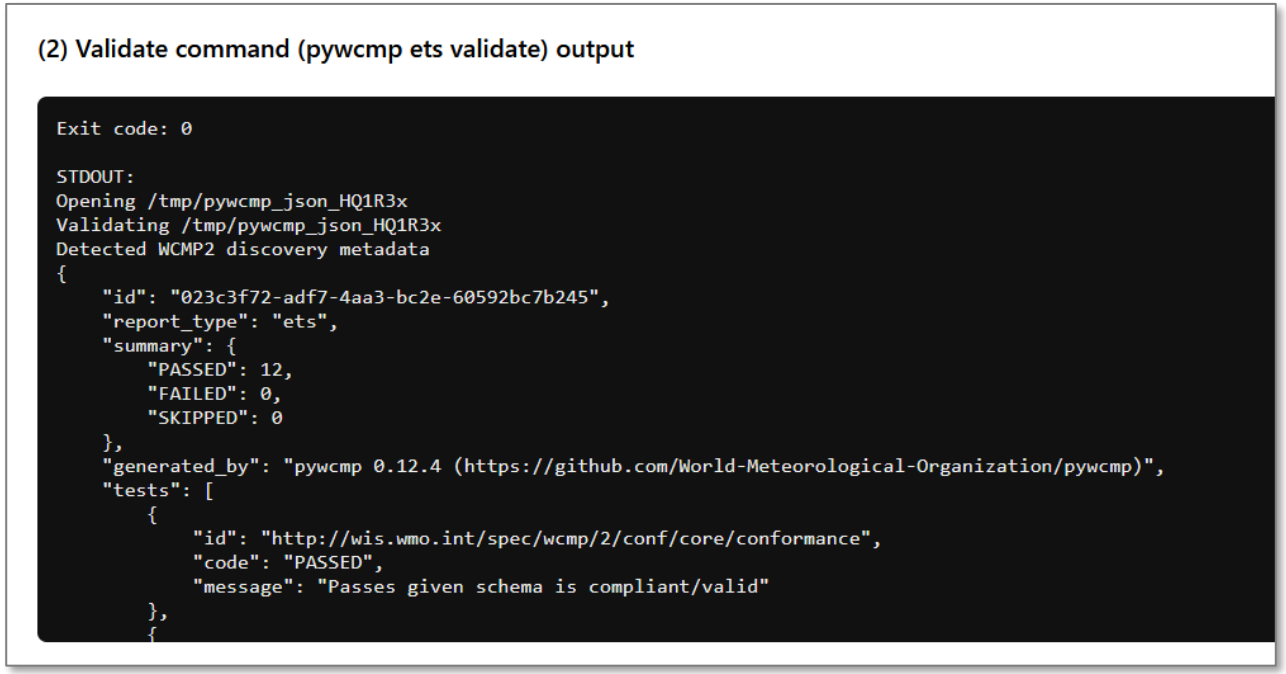


Review and Validation of the Generated Metadata

- **pywcmp** is a Python tool that provides **validation and quality assessment capabilities** for the WMO WIS Core Metadata Profile (WCMP).
  - GitHub repository: https://github.com/World-Meteorological-Organization/pywcmp
- Installation is straightforward on Linux systems (including WSL).
- On my webpage, we've enabled metadata validation using **pywcmp**.
  - Note: Quality assessment features are not included.

Review and Validation of the Generated Metadata

- To validate using **pywcmp**, click **(2) Validate**. The validation results will be displayed.
- If there are no issues, the summary will show:
  - `"PASSED": 12, "FAILED": 0`
- If you've modified the input, please click **(1) Format** first, then **(2) Validate**.

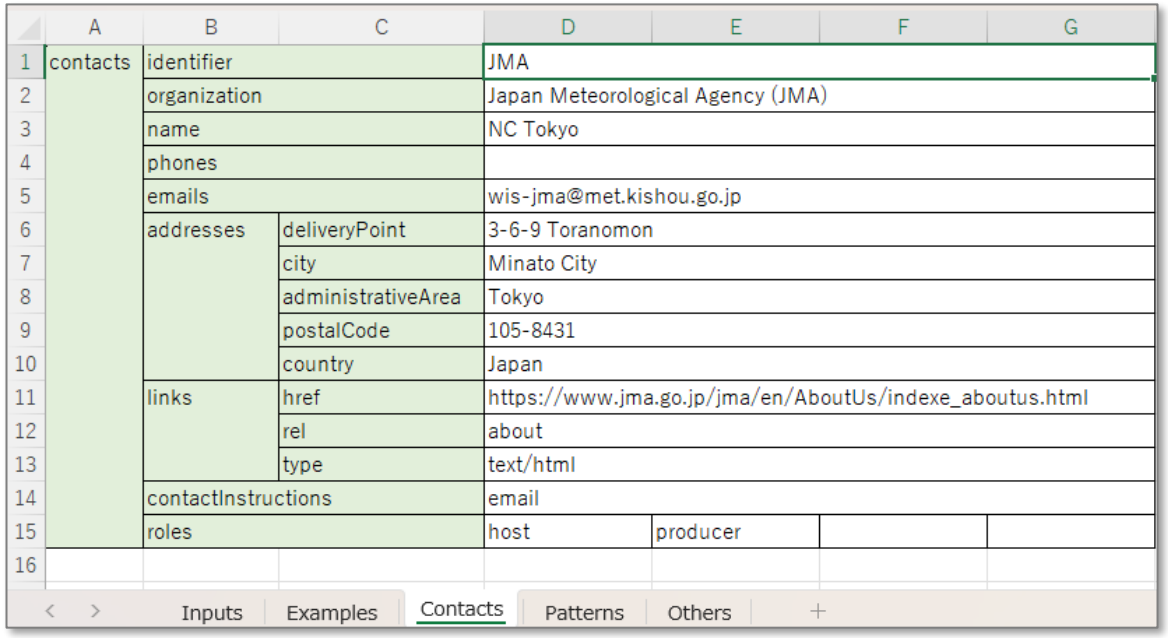


Generating Metadata with an Excel Macro

- Try generating metadata for your country’s observational data
  - Now, go back to **JMA-WS2025_item08_metadataGenerator.xlsm**.

Generating Metadata with an Excel Macro

- Please enter your country's contact information in the **Contacts** sheet.
  - Not all fields are mandatory.
  - For example, JMA has a 24-hour phone number, but since English support is limited, we've chosen to omit it.



	A	B	C	D	E	F	G
1	contacts	identifier		JMA			
2		organization		Japan Meteorological Agency (JMA)			
3		name		NC Tokyo			
4		phones					
5		emails		wis-jma@met.kishou.go.jp			
6		addresses	deliveryPoint	3-6-9 Toranomon			
7			city	Minato City			
8			administrativeArea	Tokyo			
9			postalCode	105-8431			
10			country	Japan			
11		links	href	https://www.jma.go.jp/jma/en/AboutUs/indexe_aboutus.html			
12			rel	about			
13			type	text/html			
14		contactInstructions		email			
15		roles		host	producer		
16							

Inputs | Examples | Contacts | Patterns | Others

Generating Metadata with an Excel Macro

- We'll now proceed to enter data-related information using the **Inputs** sheet (*Not **Examples** sheet*).
  - If time is limited, you may delete rows **8 to 11** and try generating output for just **one file**.

- The **centre_id** should start with the ccTLD (Country Code Top Level Domain) of your country, followed by a dash (-) and an abbreviated name of your organization.
  - https://en.wikipedia.org/wiki/Country_code_top-level_domain#A
- Please enter appropriate values for **title**, **description**, and **keywords** as needed.
- Just use today's date and time for both **created** and **updated**—that's fine for this exercise.

Generating Metadata with an Excel Macro

- The **wmo:dataPolicy** field accepts two options: **core** or **recommended**.
- The **geometry type** can be set to **Polygon**, **Point**, or **null**.
  - If your dataset includes multiple observation points, use **Polygon** to define the overall coverage area.
  - In this exercise, you don't need to provide precise latitude and longitude—approximate values are perfectly fine
- The **time type** can be set to **date**, **timestamp**, **interval**, or **null**.
  - If your dataset involves continuous observation, **interval** is the recommended option.
  - You can either specify a time of day, or provide a start date with **no end**.
  - Refer to the **Examples** sheet for sample entries.

Generating Metadata with an Excel Macro

- For datasets distributed via MQTT, the **links.href** field must contain the MQTT broker URL, and the **links.channel** field must specify the topic to which clients can subscribe.
  - **mqtts://** — Indicates the use of MQTT over TLS/SSL (i.e., a secure connection, similar to HTTPS for web).
  - **everyone:everyone@** — These are the username and password used for authentication. In this case, both are set to "everyone" (often used for public or demo brokers).
  - **mqtt.wis-jma.go.jp** — This is the hostname of the MQTT broker (i.e., the server that distributes messages). For this exercise, it’s fine to use placeholder values like example.com.
  - **:8883** — This is the port number used for secure MQTT connections. Port 8883 is the standard for MQTT over TLS.
- You can include multiple sets of links entries if needed. For datasets marked as **Recommended**, specifying a **License** in the links section is required.

Review and Validation of the Generated Metadata

- As before, you can format and validate your JSON using the following web page.
  - *A URL was originally included here; however, the webpage was temporary and is no longer accessible.*
- However, if the center ID (e.g., jp-jma) is not registered, a validation error will occur.
  - To participate in WIS2, you must apply for registration with WMO.

(2) Validate command (pywcmp ets validate) output


```
Exit code: 1

STDOUT:
Opening /tmp/pywcmp_json_JbbW7a
Validating /tmp/pywcmp_json_JbbW7a
Detected WCMP2 discovery metadata
{
    "id": "3fbdc5dd-de85-42e1-b8d5-3d0a6dcc4473",
    "report_type": "ets",
    "summary": {
        "PASSED": 11,
        "FAILED": 1,
        "SKIPPED": 0
    },
    "generated_by": "pywcmp 0.12.4 (https://github.com/World-Meteorological-Organization/pywcmp)",
    "tests": [
        {
            "id": "http://wis.wmo.int/spec/wcmp/2/conf/core/conformance",
            "code": "PASSED",
            "message": "Passes given schema is compliant/valid"
        },
```


(2) Validate command (pywcmp ets validate) output


```
            "message": "Passes given schema is compliant/valid"
        },
        {
            "id": "http://wis.wmo.int/spec/wcmp/2/conf/core/identifier",
            "code": "FAILED",
            "message": "Invalid centre_id: jp-takumu"
        },
        {
            "id": "http://wis.wmo.int/spec/wcmp/2/conf/core/links",
            "code": "PASSED"
```

Thank you for your attention