

Creating your own BUFR mapping template for CSV to BUFR

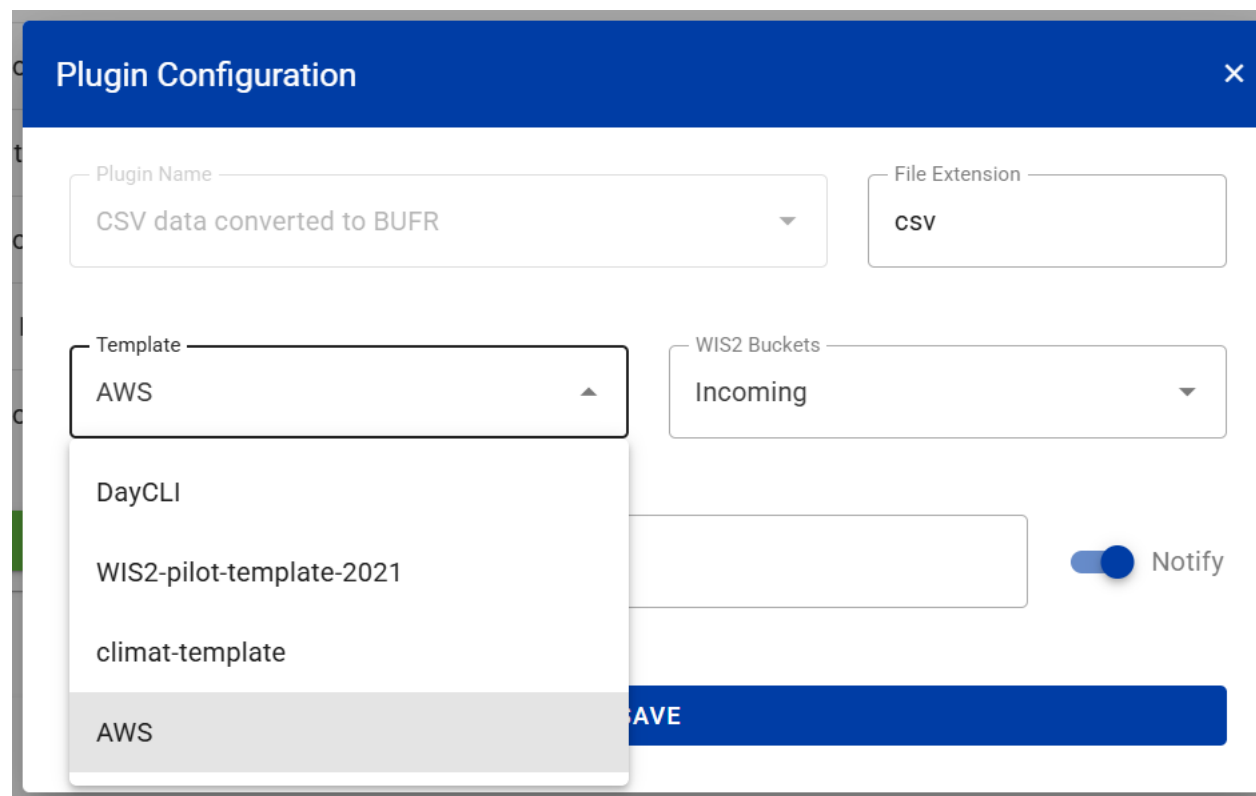
CSV-to-BUFR mapping templates

The BUFR template mappings included in wis2box are example templates as defined in:

<https://github.com/World-Meteorological-Organization/csv2bufr-templates>

Built-in templates have **limited use**:

- Input CSV data has to be formatted to have the exact column names as defined in the template
- **Only the parameters included in the template can be encoded into BUFR**



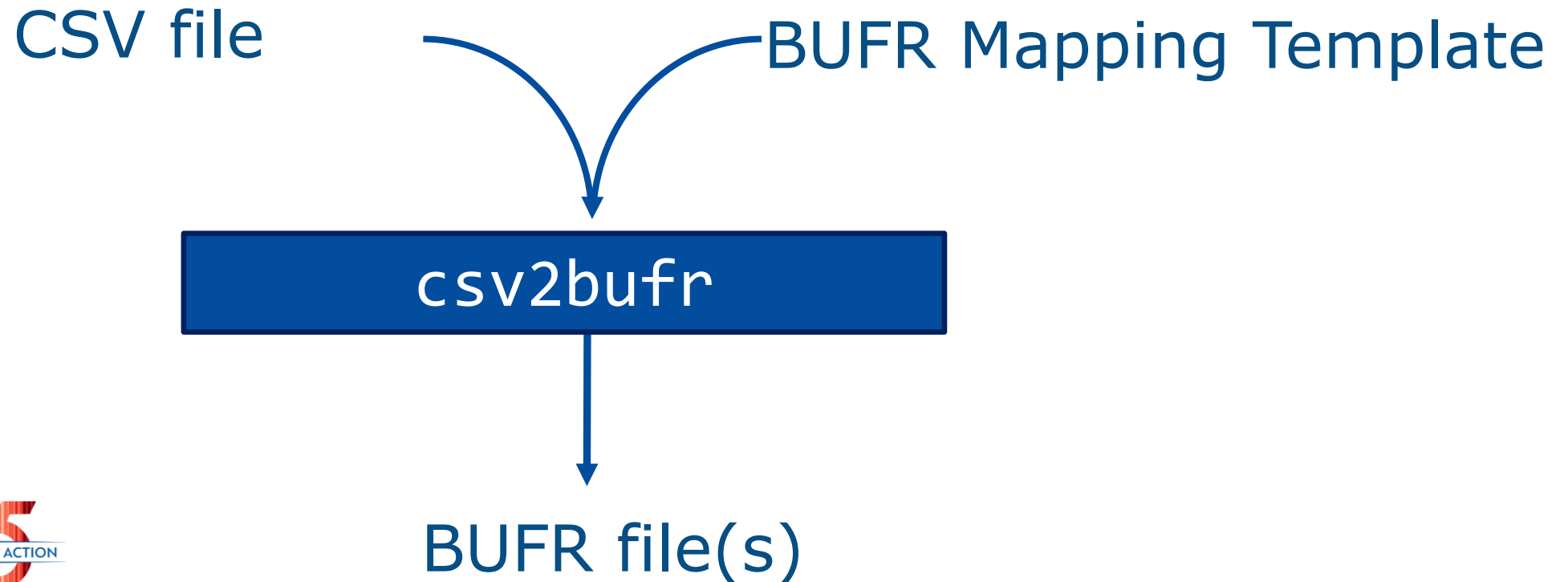
The screenshot shows a 'Plugin Configuration' dialog box with the following fields and options:

- Plugin Name:** A dropdown menu currently showing 'CSV data converted to BUFR'.
- File Extension:** A text input field containing 'CSV'.
- Template:** A dropdown menu currently showing 'AWS'. A list of available templates is open below it, including 'DayCLI', 'WIS2-pilot-template-2021', 'climat-template', and 'AWS' (which is highlighted).
- WIS2 Buckets:** A dropdown menu currently showing 'Incoming'.
- Notify:** A toggle switch that is currently turned on.
- SAVE:** A blue button at the bottom right of the dialog.

CSV-to-BUFR mapping templates

Defining your own BUFR Mapping Template enables you to:

- **Map to column-names specific to your input CSV**
- **Set your own min/max values for quality-control**
- **Encode any parameter defined in <https://confluence.ecmwf.int/display/ECC/BUFR+tables>**



BUFR Tables for ecCodes

<https://confluence.ecmwf.int/display/ECC/BUFR+tables>

3 types of tables are used:

- **Element tables** translate BUFR descriptors to **human readable ecCodes-key** and define **Units** and **Scale** of the data
- **Sequences tables** define a series of elements
- **Code-flags tables** define controlled vocabularies

Last number of WMO=X table contains all previous table-versions

▼ BUFR tables

- BUFR code-flag tables
- BUFR element tables
- BUFR sequence tables

- WMO=36 element table
- WMO=37 element table
- WMO=38 element table
- WMO=39 element table
- WMO=40 element table
- WMO=41 element table
- **WMO=42 element table**

BUFR Sequence Examples

BUFR sequence 301011
groups 3 elements for Date:

Sequences **301011** - table entries

Position	FXXYYY
1	004001
2	004002
3	004003

BUFR sequence 301012
groups 2 elements for Time:

Sequences **301012** - table entries

Position	FXXYYY
1	004004
2	004005

Information about each element is listed in the BUFR element tables:

Class 4 - Location (time)

FXXYYY	Class (XX)	Code (YYY)	Name	Key	Units	Scale	Reference	Width	CREX units	CREX scale	CREX width
004001	4	1	YEAR	year	a	0	0	12	a	0	4
004002	4	2	MONTH	month	mon	0	0	4	mon	0	2
004003	4	3	DAY	day	d	0	0	6	d	0	2
004004	4	4	HOUR	hour	h	0	0	5	h	0	2
004005	4	5	MINUTE	minute	min	0	0	6	min	0	2
004006	4	6	SECOND	second	s	0	0	6	s	0	2

How to make your own BUFR Mapping Template

Login to wis2box-api docker container:

```
python3 wis2box-ctl.py login wis2box-api
```

Run the “csv2bufr mappings create” command for the BUFR sequences and/or elements you want to map:

```
csv2bufr mappings create 301150 301011 301012 301021 007031 302001 --output  
/data/wis2box/mappings/my_own_template.json
```

Note: the directory /data/wis2box/mappings is mapped to \$WIS2BOX_HOST_DATADIR/mappings allowing you to edit the file on the host

Use custom csv2bufr template in BUFR

You can select the new template in the **Plugin Configuration** of the Dataset Mappings Editor in the wis2box-webapp:

Plugin Configuration

Plugin Name: CSV data converted to BUFR

File Extension: CSV

Template: my_custom_template

WIS2 Buckets: Incoming

my_custom_template

WIS2-pilot-template-2021

DayCLI

AWS

climat-template

Notify

SAVE

ADD A PLUGIN +

Or define the custom BUFR mapping in the csv2bufr plugin configuration in a metadata-yaml MCF as follows:

```
CSV:
- plugin: wis2box.data.csv2bufr.ObservationDataCSV2BUFR
  template: /data/wis2box/mappings/my_custom_template.json # custom BUFR mapping
  notify: true
  file-pattern: '^.*\.csv$'
```

Debugging custom csv2bufr template in BUFR

Debug your BUFR mapping template using **csv2bufr command line** within the wis2box-api container

Put test_data.csv in \$WIS2BOX_HOST_DATADIR/mappings
(mapped to /data/wis2box/mappings in wis2box-api container)
and run the the command `csv2bufr data transform`

```
python3 wis2box-ctl.py login  
csv2bufr data transform --bufr-template /data/wis2box/mappings/my_own_template.json  
/data/wis2box/test_data.csv
```

Check for **output-errors** and edit the custom template as required

Use **bufr_dump** to inspect the BUFR-file created by the transform and **check all required data is encoded**

Summary

Create your own BUFR mapping templates for CSV-to-BUFR conversion enables you to:

- **Encode any data element defined in the [ecCodes BUFR Tables](#)**
- **Configure your own quality control checks**
- **Define CSV-column names in the mapping template to match your input-data**

The command line tool “`csv2bufr mappings create`” inside the `wis2box-api` container helps you to quickly create a new mappings file, which can be edited to suit your needs

Thank you

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