



# PITHIA-NRF

Plasmasphere Ionosphere Thermosphere Integrated  
Research Environment and Access services:  
a Network of Research Facilities



## Static Datasets Registration

at PITHIA e-Science Centre

### *User Guide*

Version 1.2

October 20, 2025



The PITHIA-NRF project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101007599

## **Table of Contents**

1.	Terminology and Abbreviations .....	2
2.	Introduction.....	3
3.	Publishing Static Datasets.....	3
3.1.	Publishing Static Dataset Entries.....	6
3.2.	Publishing Data Subsets.....	9

## 1. Terminology and Abbreviations

DOI	Digital Object Identifier
DQ	Data Quality
DQF	Data Quality Flag
eSC	e-Science Centre
URL	Uniform Resource Locator
Data Level	Level of information processing ranging from Level 0 (unprocessed) to Level 4 (derived by secondary analysis of lower-level data or by modelling).
Data Quality Flag	DQ flag describes measures taken to clean and validate the data, as well as characterise the residual data noise. Commonly, Data Level 1 refers to observed properties of the instrument probing signal while Data Level 2 corresponds to the derived geophysical properties of the Feature of Interest.
Data Resource	Single data service item and its associated metadata, available through the PITHIA-NRF system.
Dataset	Pre-computed or pre-processed data resource available for download.
Data Subset	A portion of a Data Collection for registration as Static Dataset.
Features of Interest	[ <i>standard ISO vocabulary</i> ]: Real-world object that carries the property which is observed or modelled to produce a Data Collection
ISO	International Standards Organisation
Metadata Model	[ <i>science-neutral</i> ]: Specification of different documents and their contents that are required for registration of data resources
Ontology	[ <i>science-specific</i> ]: A set of standard vocabularies for the selected domain of science
Phenomenon	[ <i>standard ISO vocabulary</i> ]: A physical observable (a.k.a. “Mother Nature”). Not to confuse with events; phenomena are not defined in time or space. The top-level phenomenon categories are Field, Particle, and Wave.
Static Datasets	[ <i>standard PITHIA vocabulary</i> ]: A listing of events or investigations assembled to aid users in locating data of interest. Each Entry in a Static Dataset has distinct begin and end times and a list of

registered Data Subsets with optional DOIs to their persistent storage.

## 2. Introduction

This document provides detailed instructions on how users can register and publish Static Datasets at the PITHIA e-Science Centre (eSC).

As mentioned in the related interface in the eSC, a Static Dataset Entry is “*A listing of events or investigations assembled to aid users in locating data of interest. Each Entry in a Static Dataset has distinct begin and end times and a list of registered Data Subsets with optional DOIs to their persistent storage.*”.

Four categories of Static Datasets are published at the eSC:

- **Datasets Used in an Academic Publication:** Datasets placed in a static storage for a publication in an academic journal that required persistent access to the source data.
- **Training Datasets for a Machine Learning Model:** Training dataset for a Machine Learning model allocated by the model designer and stored in a persistent repository for posterity. Catalog Entry registers the model, and Data Subset registers the training dataset. Retraining of the model results in registration of another Data Subset document for the same Catalog Entry.
- **Data Pertaining to an Event:** Subset of unpublished data (graphical, numerical) with distinct start and stop times that correspond to a registered event in the Event Catalogue.
- **Data from an Experiment Campaign:** Data collection during planned experiments and observation campaigns such as the World Day.

## 3. Publishing Static Datasets

After logging in, registered users are presented with a landing page similar to the one shown in Figure 1. At the bottom of Figure 1, the user can see the institution they are a member of and select to manage their registrations (Figure 2), i.e. register new Data Collections, Workflows, and Static Datasets and/or edit the existing ones.

 **PITHIA**  
e-Science Centre

Help & Support |  Aggeliki (National Observatory of ...) ▾

Data Collections ▾ Workflows ▾ Static Datasets ▾ Space Physics Ontology and Metadata Model ▾ Manage Registrations ▾ About PITHIA-NRF

### PITHIA e-Science Centre

#### Data Collections

- [!\[\]\(c1c13e32f5099222ca8eb2c0edc64160\_img.jpg\) ?  
Search by Content](#)
- [!\[\]\(4d11ca7b3fd6face42df5840f6181c44\_img.jpg\) ?  
Simple Search](#)
- [!\[\]\(e0aa52f2e93c8a15a0abe3f6fd93da03\_img.jpg\) ?  
All Data Collections](#)
- [!\[\]\(deed1602b68c66088d7bdb8e2aaea4d3\_img.jpg\) ?  
Data Collection-related Metadata](#)

#### Workflows

- [!\[\]\(daf3bf731f4c930ce264b4e7fb604657\_img.jpg\) ?  
Search by Content](#)
- [!\[\]\(903db9fcd4c83dc79118047b1caee2a1\_img.jpg\) ?  
All Workflows](#)

#### Features of Interest

Real-world object that carries the property which is observed or modelled to produce a Data Collection.

- [SolarSystem  
75 Data Collections](#)
- [SolarSystem: Celestial Body  
72 Data Collections](#)
- [SolarSystem: Heliosphere  
1 Data Collection](#)
- [SolarSystem: Sun  
5 Data Collections](#)

#### Static Datasets

- [!\[\]\(deec3bd7ddc76f736b74a4f9de028b5f\_img.jpg\) ?  
Search by Content](#)
- [!\[\]\(f5c9d1670e99070850d6a31606c69e25\_img.jpg\) ?  
All Static Datasets](#)

#### Space Physics Ontology and Metadata Model

- [!\[\]\(ddf053eb7d80a50752b367feb43bce58\_img.jpg\) ?  
Space Physics Ontology Guide](#)
- [!\[\]\(a358e7dc9ec849b9f95475a99387789a\_img.jpg\) ?  
Space Physics Ontology Browser](#)
- [!\[\]\(20508942075fdd4f1fe8b4892be772d5\_img.jpg\) ?  
Space Physics Metadata Model](#)

#### Space Physics Ontology and Metadata Model

- [!\[\]\(a227b3274715a19fd8c194415dff3428\_img.jpg\) ?  
Space Physics Ontology Guide](#)
- [!\[\]\(860dacfbf347bc7ca257a278a0eaf30f\_img.jpg\) ?  
Space Physics Ontology Browser](#)
- [!\[\]\(d138f1aac46417c782dbc8b645712088\_img.jpg\) ?  
Space Physics Metadata Model](#)

#### Registration Help

- [!\[\]\(863b0a7ef845c59c49cc10414b828527\_img.jpg\) ?  
Data Resource Registration Guide](#)

#### National Observatory of Athens

- [Manage Registrations](#)
- [View Members](#)

#### e-Science Centre Institutions

- [Register a New Institution](#) 
- [Join Another Institution](#)

Contact Support | Privacy Policy | Terms of Use | About PITHIA-NRF |  Theme ▾

---

This work uses the EGI infrastructure with the dedicated support of IN2P3-IRES

© 2021-2025 PITHIA-NRF

**Figure 1 – Landing page of a registered user with an active membership in an institution**

## National Observatory of Athens

- [Manage Registrations](#)
- [View Members](#)

**Figure 2 – Manage registrations option for a specific institution**

For users to publish Static Datasets, they must choose the "Manage Registrations" option, which directs them to the corresponding page, as shown in Figure 3.

The screenshot shows the PITHIA e-Science Centre homepage. At the top, there is a navigation bar with links for Data Collections, Workflows, Static Datasets, Space Physics Ontology and Metadata Model, Manage Registrations, and About PITHIA-NRF. Below the navigation bar, there is a logo for PITHIA e-Science Centre. The main content area is titled "Manage Registrations" and contains three buttons: "Data Collection-related Metadata", "Static Dataset-related Metadata", and "Workflows".

**Figure 3 – Manage Registrations Page for a Specific Institution**

As this guide focuses only on Static Datasets, the user must choose the option “Static Dataset-related Metadata”. This action directs users to the related page, where they must first register any required “Static Dataset Entries” and then “Data Subsets”, as shown in Figure 4.

The screenshot shows the "Static Dataset-related Metadata" management page. At the top, there is a breadcrumb navigation showing "Home > Manage Registrations". Below the breadcrumb, there is a section titled "Static Dataset-related Metadata" with two numbered steps: "1. Static Dataset Entries 5" and "2. Data Subsets 16". To the right of this section, there is a sidebar with the heading "Static Dataset-related Metadata" and a descriptive text about registering static datasets. The sidebar also includes a link to the "data resource registration guide".

**Figure 4 – Manage Page for Static Datasets-related Metadata**

The subsequent section provides the instructions for registering both types of Static Dataset-related Metadata.

### 3.1. Publishing Static Dataset Entries

Figure 5 displays the Static Dataset Entries management page, where a user can register a new Static Dataset Entry or update an existing one. This guide focuses on new registrations, specifically through the “Register with Wizard” option, which offers a graphical user interface.

The screenshot shows the 'Static Dataset Entries' management page. At the top, there are navigation links: Home > Manage Registrations > Static Dataset-related Metadata. Below this, it says 'National Observatory of Athens' and 'Static Dataset Entries'. There are two buttons: 'Register via File Upload' and a blue button with white text '+ Register with Wizard'. A table lists five registered entries:

Name	Updated by	Actions
TNA Reports StaticDatasetEntry_TNA_Reports_pithia	A [redacted]	
Geomagnetic Storm of March 2015 StaticDatasetEntry_Geomagnetic_Storm_Of_March_2015_noa	C [redacted]	
Hunga-Tonga Volcano Eruption 2022 StaticDatasetEntry_Hunga-Tonga_Volcano_Eruption_2022_noa	A [redacted]	
LSTIDs Forecasting with the Temporal Fusion Transformer (TFT) StaticDatasetEntry_LSTIDs_Forecasting_With_The_Temporal_Fusion_Transformer_TFT_noa	A [redacted]	
Geomagnetic Storm of May 2024 StaticDatasetEntry_Solar_Storms_Of_May_2024_noa	A [redacted]	

To the right of the table, there is a sidebar with the title 'Static Dataset Entries' and a description: 'A listing of events or investigations assembled to aid users in locating data of interest. Each Entry in a Static Dataset has distinct begin and end times and a list of registered Data Subsets with...'. It also shows '5 registered' and 'No outdated registrations found'.

**Figure 5 – Static Dataset Entries Management Page**

Having selected the “Register with Wizard” option (Figure 5), users see a form where they must enter all related information. The mandatory fields are indicated by a red asterisk.

The information is divided into the following categories:

1. **New Static Dataset Category** (Figure 6), where users must:
  - a. Choose from drop-down menu the category of the Static Dataset; the available categories are:
    - Datasets Used in an Academic Publication.
    - Training Datasets for a Machine Learning Model.
    - Data Pertaining to an Event.
    - Data from an Experiment Campaign.

- b. Provide the name of the Static Dataset.
  - c. Select from the drop-down list the associated organisation.
2. **Identifier** (Figure 7), which includes dynamically generated information specifically for the eSC. Here, the users can only modify the metadata version.
3. **Description** (Figure 8), where the user describes the registration that will be shown when someone finds and reads the specific registration-related information.
4. **Features of Interest (Named Regions)** (Figure 9), offers a drop-down list where the users must select the related feature of interest. Details on the vocabulary are available at <https://esc.pithia.eu/ontology/categories/featureOfInterest/>. Further information on the PITHIA Space Physics Ontology can be found on the relevant guide at <https://esc.pithia.eu/ontology/guide/>.
5. **Phenomenon Time** (Figure 10), where the user can optionally add the phenomenon's begin and end times.
6. **Validate and Register** (Figure 11), once all the above options are complete the user clicks the “Validate and Register” button, and the eSC completes the registration providing a confirmation message.

Home > Manage Registrations > Static Dataset-related Metadata > Static Dataset Entries

National Observatory of Athens

## New Static Dataset Entry

\* indicates a required field

Static Dataset Category \*

Static Dataset Entry Full Name \*

Organisation Associated With the Static Dataset Entry \*

Wizard Menu  
Changes are automatically saved in your browser (except for files).

**Figure 6 – Static Dataset Entry: Full Name and Associated Organisation**

Metadata Sections

Static Dataset Category

Full Name and Organisation

Identifier

Description

Features of Interest

Phenomenon Time

**Identifier**

Metadata Version \*

The version number of the object being identified.

1

► Local ID and Namespace

**Wizard Menu**  
Changes are automatically saved in your browser (except for files).

Save

Reset

**Figure 7 – Static Dataset Entry: Identifier**

Metadata Sections

Static Dataset Category

Full Name and Organisation

Identifier

Description

Features of Interest

Phenomenon Time

**Description \***

A free-text description of the static dataset entry contents.

**Wizard Menu**  
Changes are automatically saved in your browser (except for files).

Save

Reset

**Figure 8 – Static Dataset Entry: Description**

Metadata Sections

Static Dataset Category

Full Name and Organisation

Identifier

Description

Features of Interest

Phenomenon Time

**Features of Interest (Named Regions) \***

Space region which is the feature of the interest of the observation or a sampled feature. This attribute takes values from a controlled vocabulary.

**Wizard Menu**  
Changes are automatically saved in your browser (except for files).

Save

Reset

**Figure 9 – Static Dataset Entry: Features of Interest**

The screenshot shows a user interface for entering static dataset information. On the left, there is a vertical sidebar with tabs: Identifier, Description, Features of Interest, and Phenomenon Time. The 'Phenomenon Time' tab is selected. The main area has a title 'Phenomenon Time' and a note: 'Adding information on the phenomenon time is optional. If you would like to add this, you must fill out all of the phenomenon-time-related fields below.' Below this are two date input fields: 'Begin Time' and 'End Time', each with a calendar icon. In the top right corner, there is a 'Reset' button.

**Figure 10 – Static Dataset Entry: Phenomenon Time**

The screenshot shows a large, empty rectangular area with a thin blue border. In the center of this area is a blue rectangular button with the text 'Validate and Register' in white.

**Figure 11 – Static Dataset Entry: Validate and Register**

### 3.2. Publishing Data Subsets

Figure 12 displays the Data Subsets management page, where a user can register a new Data Subset or update an existing one. This guide focuses on new registrations, specifically through the “Register with Wizard” option, which offers a graphical user interface.

Home > Manage Registrations > Static Dataset-related Metadata

National Observatory of Athens

## Data Subsets

[Register via File Upload](#) [+ Register with Wizard](#)

Name	Updated by	Actions
Spectral analysis of local ground-based GNSS-derived TEC time series in view of its' Sensitivity to Earthquakes in Aegean region DataSubset_Spectral_Analysis_Of_Local_Ground-based_GNSS-derived_TEC_Time_Series_In_View_Of_Its_Sensitivity_To_Earthquakes_In_Aegean_Region_noa	W [redacted]	
Sensitivity of Ionospheric Disturbance detection by Swarm in time of strong Earthquakes in Aegean region DataSubset_Sensitivity_Of_Ionospheric_Disturbance_Detection_By_Swarm_In_Time_Of_Strong_Earthquakes_In_Aegean_Region_noa	W [redacted]	
Hunga-Tonga Volcano Eruption 2022: DIDBase Manually Scaled Ionograms DataSubset_Hunga-Tonga_Volcano_Eruption_2022_DIDBase_Manually_Scaled_Ionograms_noa	A [redacted]	
Comparative Analysis of Topside Ne-Profiles: NeQuick2 and 3D EDD Models Against Radio Occultation Measurements Over Europe DataSubset_Comparative_Analysis_Of_Topside_Ne_Profiles_NeQuick2_And_3D_EDD_Models_Against_Radio_Occultation_Measurements_Over_Europe_noa	O [redacted]	

**Data Subsets**  
A listing of events or investigations assembled to aid users in locating data of interest. Each Entry in a Static Dataset has distinct begin and end times and a list of registered Data Subsets with...  
[Show more...](#)

16 registered  
 No outdated registrations found

**Figure 12 – Data Subsets Management Page**

Having selected the “Register with Wizard” option (Figure 12), users see a form where they must enter all related information.

The information is divided into the following categories:

1. **New Data Subset** (Figure 13), where users must:
  - a. Provide the name of the Data Subset.
  - b. Select from the drop-down list the associated organization.
2. **Identifier** (Figure 14), which includes dynamically generated information in the eSC. Here, the users can only modify the metadata version.
3. **Description** (Figure 15), where the user provides a description of the Data Subset.
4. **Static Dataset Entries, Features of Interest and Data Collections** (Figure 16), which offers three drop-down lists where users must select the related types.
  - a. **Static Dataset Entry:** Select the appropriate Static Dataset Entry, the one to which the Data Subset belongs.
  - b. **Features of Interest (Names Regions):** Select one or more features of interest of the observation or a sampled feature related to the Data Subset. Details on the vocabulary are available at

<https://esc.pithia.eu/ontology/categories/featureOfInterest/>. Further information on the PITHIA Space Physics Ontology can be found on the relevant guide at <https://esc.pithia.eu/ontology/guide/>.

- c. **Data Collections:** Select one or more (if any) Data Collections related to the Data Subset. A full list of the eSC registered Data Collections can be found at <https://esc.pithia.eu/data-collections/>.
5. **Result time** (Figure 17), one or more time intervals included in the Data Subset.
  6. **Online Resources**, where the user selects to update the data related to the Data Subset to the eSC (*toggle on*) (Figure 18), or to provide URLs (*toggle off*) (Figure 19). More than one online resources can be added. Each online resource is fully described by providing details about its:
    - a. **Service Function** (drop-down list): The function performed by the online resource. The “Service Function” vocabulary is available at <https://esc.pithia.eu/ontology/categories/serviceFunction/>.
    - b. The **resource itself** by providing either “File” (Figure 18) or “Link to Online Resource” (Figure 19).
    - c. **Name:** The name of the online resource.
    - d. **Protocol:** The connection protocol (e.g. http, ftp, file).
    - e. **Description:** A text description of what the online resource is/does.
    - f. **Data Formats** (drop-down list): The format of the stored result accessible from the online resource. The “Data Formats” vocabulary is available at <https://esc.pithia.eu/ontology/categories/resultDataFormat/>.
  7. **Data Level** (Figure 20), the user selects the data level of the Data Subset. The “Data Level” vocabulary is available at <https://esc.pithia.eu/ontology/categories/dataLevel/>.
  8. **Quality Assessment** (Figure 21), where the user selects from the two drop-down lists the related:
    - a. Data quality flags. The “Data Quality Flags” vocabulary is available at <https://esc.pithia.eu/ontology/categories/dataQualityFlag/>.
    - b. Metadata quality flags. The “Metadata Quality Flags” vocabulary is available at <https://esc.pithia.eu/ontology/categories/metadataQualityFlag/>.
  9. **DOI** (Figure 22), where the user selects to generate a DOI related to the data subset (optional but strongly recommended).
  10. **Validate and Register** (Figure 23), once all the above options are complete, the user clicks the “Validate and Register” button, and the eSC completes the

registration, providing a confirmation message, along with the DOI (if selected the generation of a DOI in the previous step 9).

The screenshot shows a web-based form titled "New Data Subset" under the "National Observatory of Athens". The top navigation bar includes links to Home, Manage Registrations, Static Dataset-related Metadata, and Data Subsets. On the left, a sidebar lists "Metadata Sections" such as Full Name and Organisation, Identifier, Description, Static Dataset Entries, Features of Interest and Data Collections, Result Time, and Online Resources. The main form area contains fields for "Data Subset Full Name" (marked with a red asterisk) and "Organisation Associated With the Data Subset" (also marked with a red asterisk). A note indicates that a red asterisk (\*) denotes a required field. On the right, a "Wizard Menu" shows the last save time as 03:53:51 pm, with "Save" and "Reset" buttons.

**Figure 13 – Data Subset: Full Name, Associated Organisation**

This screenshot shows the "Identifier" section of the Data Subset form. It includes fields for "Metadata Version" (set to 1), "Local ID and Namespace" (with a dropdown menu open), "Local ID" (containing "DataSubset\_"), and "Namespace" (containing "DataSubset"). A note explains that the local ID is automatically generated from the full name and a timestamp will be added if it's not unique. The sidebar and Wizard Menu are also visible.

**Figure 14 – Data Subset: Identifier**

This screenshot shows the "Description" section of the Data Subset form. It features a large text area for a free-text description of the data subset contents. The sidebar and Wizard Menu are present on the right.

**Figure 15 – Data Subset: Description**

Metadata Sections

- Full Name and Organisation
- Identifier
- Description
- Static Dataset Entries, Features of Interest and Data Collections
- Result Time
- Online Resources
- Data Levels
- Quality Assessment
- DOI

## Static Dataset Entries, Features of Interest and Data Collections

Static Dataset Entry \*

The static dataset entry that this data subset belongs to.

Features of Interest (Named Regions) \*

Space region which is the feature of the interest of the observation or a sampled feature. This attribute takes values from a controlled vocabulary.

Data Collections

The PITHIA Data Collection that holds metadata for this subset.

**Wizard Menu**

Last saved in browser  
03:53:51 pm

**Figure 16 – Data Subset: Related Registrations**

Metadata Sections

- Full Name and Organisation
- Identifier
- Description
- Static Dataset Entries, Features of Interest and Data Collections
- Result Time
- Online Resources
- Data Levels

## Result Time

The intervals of time that the subset spans.

Time Period 1

Begin Time \*

End Time \*

**Wizard Menu**

Last saved in browser  
03:53:51 pm

**Figure 17 – Data Subset: Result Time related Intervals**

Metadata Sections

- Full Name and Organisation
- Identifier
- Description
- Static Dataset Entries, Features of Interest and Data Collections
- Result Time
- Online Resources
- Data Levels
- Quality Assessment
- DOI

## Online Resources

Upload Files for Each Online Resource  
 Toggle whether you would like these online resources to link to files uploaded to the e-Science Centre, or to external webpages.

**Important Note:** Files added to the wizard are not saved in the browser like other wizard data, and will not be loaded back in if you leave and re-enter the wizard.

Online Resource 1
Online Resource 2
+ Add Online Resource

! Adding information on an online resource is optional. If you would like to add this, the name, linkage and protocol for the online resource must be provided.
X Remove Tab

**Service Function**

The function performed by the online resource. E.g. Direct data download. Obtained from a controlled vocabulary.

File

No file selected.

**Name**

Name of the online resource.

**Protocol**

The connection protocol e.g. http, ftp, file.

**Description**

A text description of what the online resource is/does.

**Data Formats**

The format of the stored result accessible from the online resource. This property references a term, e.g. NetCDF, from a controlled vocabulary.

▼

**Wizard Menu**

Last saved in browser  
03:53:51 pm

**Figure 18 – Data Subset: Online Resources uploaded to the eSC**

Metadata Sections

- Full Name and Organisation
- Identifier
- Description
- Static Dataset Entries, Features of Interest and Data Collections
- Result Time
- Online Resources
- Data Levels
- Quality Assessment
- DOI

## Online Resources

Upload Files for Each Online Resource  
Toggle whether you would like these online resources to link to files uploaded to the e-Science Centre, or to external webpages.

**Important Note:** Files added to the wizard are not saved in the browser like other wizard data, and will not be loaded back in if you leave and re-enter the wizard.

Online Resource 1    Online Resource 2    + Add Online Resource

✖ Remove Tab

**Service Function**  
  
The function performed by the online resource. E.g. Direct data download. Obtained from a controlled vocabulary.

**Link to Online Resource**  
  
A location (address) for online access using a Uniform Resource Locator/Uniform Resource Identifier address.

**Name**  
  
Name of the online resource.

**Protocol**  
  
The connection protocol e.g. http, ftp, file.

**Description**  
  
A text description of what the online resource is/does.

**Data Formats**  
  
The format of the stored result accessible from the online resource. This property references a term, e.g. NetCDF, from a controlled vocabulary.

**Wizard Menu**  
Last saved in browser  
04:18:42 pm

Save    Reset

**Figure 19 – Data Subset: Online Resources registered as URLs**

Metadata Sections

- Full Name and Organisation
- Identifier
- Description
- Static Dataset Entries,

## Data Level

Data Level of the result from a controlled vocabulary.

**Wizard Menu**  
Last saved in browser  
03:53:51 pm

Save    Reset

**Figure 20 – Data Subset: Data Level**

Metadata Sections

Full Name and Organisation  
Identifier  
Description  
Static Dataset Entries, Features of Interest and Data Collections  
Result Time  
Online Resources

## Quality Assessment

Description of the Quality Assessment, including:  
(a) Scientific quality  
(b) Quality of metadata  
(c) Operational quality of data resources

Data Quality Flags \*

Metadata Quality Flags

Wizard Menu

Last saved in browser  
03:53:51 pm

Save  
 Reset

**Figure 21 – Data Subset: Quality Assessment**

Data Levels

Quality Assessment  
DOI

DOI

Generate a DOI for this Data Subset

**Figure 22 – Data Subset: DOI generation**

Validate and Register

**Figure 23 – Data Subset: Validate and Register**