



Announcing and Registering DOE's Datasets via Announcement Notice (AN) 241.6

Manual Version 7.3, May 2022

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DOE Data ID Service Background

In 2011, OSTI joined DataCite to facilitate citing, accessing, and reusing publicly available scientific research datasets produced by DOE-funded researchers. DataCite, an international non-profit organization that registers digital object identifiers (DOIs) with the [International DOI Foundation](#), develops and maintains the metadata schema tailored for describing scientific data and software, and provides infrastructure for allocating DOI prefixes, registering DOIs and associated metadata, and managing DOIs. The U.S. Department of Energy (DOE) Office of Scientific and Technical Information (OSTI), through the DOE Data ID Service, assigns DOIs to datasets announced by DOE and its contractor and grantee researchers and registers the DOIs with [DataCite](#) to aid in citation, discovery, retrieval, and reuse. OSTI assigns and registers DOIs for datasets for DOE researchers as a free service to enhance the Department's management of this important resource. OSTI refers to individual data centers at DOE-funded organizations as data clients, and sets up data client accounts to allow for tailored customization of features, which will be detailed in later sections of this manual.

1. About E-Link and AN 241.6

DOE OSTI develops and maintains E-Link, an electronic submission tool for DOE-funded scientific and technical information (STI). E-Link provides Announcement Notices (ANs) or submission tools to submit various types of STI and associated metadata. The E-Link¹ AN 241.6, the Scientific Research Datasets AN, allows for the metadata needed to identify/announce datasets resulting from work funded by DOE to be provided to OSTI. The submitted metadata allows the assignment of DOIs to datasets through the DOE Data ID Service. This value-added step of assigning a DOI facilitates visibility, ensures long-term preservation, (re)usability

¹ [E-Link](#) facilitates the electronic submittal of STI between DOE and its client community including researchers, reviewers, research administrators, and others doing business with DOE. STI deliverables provided to DOE through E-Link are announced, as appropriate, on web products maintained by OSTI, which provide free and convenient public access to full text and bibliographic data of products resulting from DOE-funded research.

and supports better linkages between DOE's published research results and the underlying data.

The DOE Data ID Service offers three options to submit metadata for DOIs:

1. Scientific Research Datasets 241.6 Web Submission Interface – Single metadata record

The 241.6 Web Submission Interface for manual entry of metadata is a good option for low-volume data clients. Researchers at DOE national laboratories should contact their site's [STI Manager](#)² to arrange for manual submittal.

2. Application Programming Interface (API) – Multiple metadata records

OSTI offers an Application Programming Interface (API) for POST (submit) and GET (retrieval) functions to a communication channel called an endpoint.

Testing in the API is required prior to receiving a production account. Please contact OSTI: DOEDataID@osti.gov to set up a test account with credentials.

- Test E-Link Endpoint: <https://www.osti.gov/elinktest/2416api>
- Production E-Link Endpoint: <https://www.osti.gov/elink/2416api>

For more information about the API, please click here:

[E-Link 241.6 API Documentation](#)

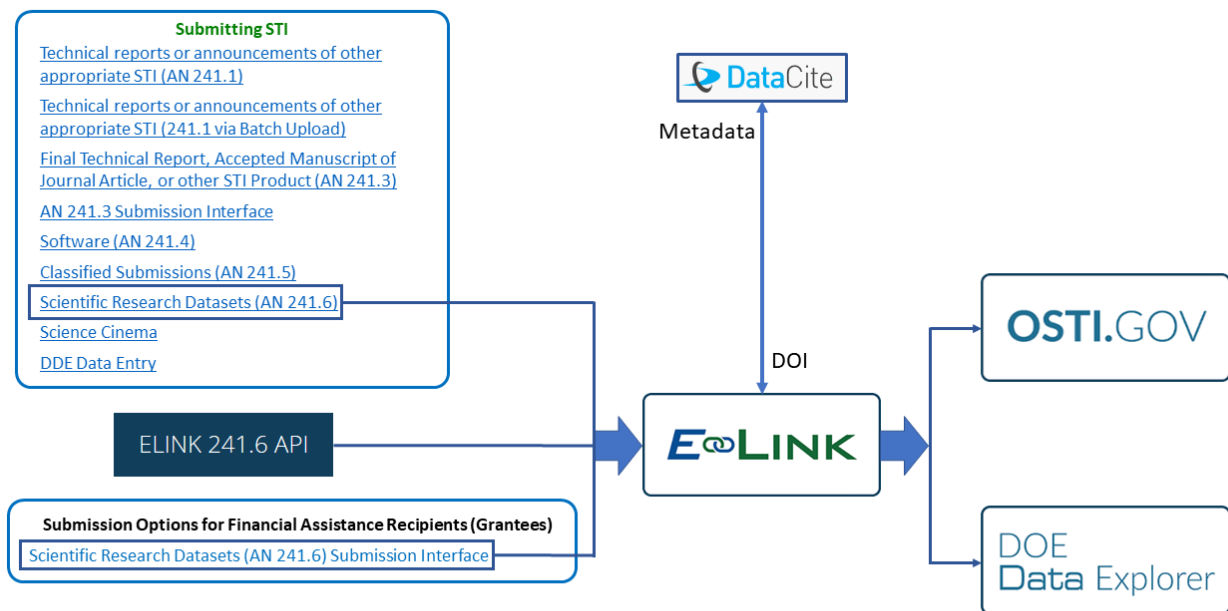
² Each DOE national Laboratory has a designated point of contact for coordinating submissions of scientific and technical information (STI) to OSTI.

3. Financial Assistance recipients (Grantees) can submit metadata for their individual datasets without log-in credentials using the Scientific Research Datasets (AN 241.6) Submission Interface found at:

<https://www.osti.gov/elink/2416-submission.jsp>

The workflow below explains the entire submission workflow from submission to E-Link to display in OSTI's output search products.

Dataset Record Submission Workflow



The user can submit a dataset metadata record to OSTI either through the 241.6 Web Submission Interface (either by logging in for DOE sites or using the Financial Assistance Step-by-Step version for grantees) or the Application Programming Interface (API). If successful, the metadata is submitted to E-Link, OSTI's ingest system. OSTI then sends the metadata record to DataCite to register the DOI. After the record has been processed in E-Link, it will be displayed in both [OSTI.GOV](https://www.osti.gov) and [DOE Data Explorer](https://dataexplorer.doe.gov).

1.1 Why should I get a DOI?

DOIs allow people to more easily discover research and technology objects, access them, and reuse them for verification of the original experiment or to produce new results with the latest methods.

DOIs facilitate linkages among outputs – published articles, patents, technical reports, data, software, and other research objects.

DOIs are easy to cite in a standardized way to give inventors, authors, or creators the proper attribution.

DOIs can be assigned to any digital entity a user wishes to persistently identify, primarily for sharing with an interested user community or managing as intellectual property.

DOI links are “persistent”. That is, DOIs resolve to a URL that can be updated even if domain names change and/or the domain naming system itself is replaced. This characteristic can be helpful to agencies as they often undergo reorganizations and renaming. A DOI can ensure the long-term integrity of identifiers in these situations.

DOIs are cross-disciplinary – used in the humanities, social sciences, physical sciences and in a number of communities that frequently interact with the scholarly literature, such as non-governmental organizations (NGOs), intergovernmental organizations (IGOs), patent systems, and standards bodies.³

DOIs help make data [FAIR](#) (Findable, Accessible, Interoperable, Reusable). Specifically, DOIs help make data findable, and OSTI makes data accessible, interoperable, and reusable. See the [FAIR Data Principles](#) for a more detailed explanation of FAIR.

³ This has been slightly modified from Crossref's persistent identifiers webpage at <https://www.crossref.org/blog/global-persistent-identifiers-for-grants-awards-and-facilities/>

1.2 General Requirements

General requirements have been established for data registration. The submitter must:

- Provide the required metadata to enable basic, bibliographic citation
- Have the authority to make the data public, as the data owner, PI, or other designated submitter
- Guarantee the persistence of registered data
 - Ensuring that data are stored and managed for indefinite access and usability
 - Maintaining and updating all landing pages/URLs associated with the DOI

OSTI DOES NOT CURRENTLY PROVIDE A REPOSITORY TO HOST DATASETS.

1.3 Understanding Key Components

Granularity is the level of depth represented by the data. More granularity means a very focused detail, the most precision. Less granularity is a summary view of data and transactions.

- Determining the level at which DOIs are assigned to data is one of the first steps in planning data DOI registration.
- DOIs can be assigned at varying granularity. The granularity of data can be dependent upon the type of data. Subject matter expertise and knowledge of how researchers use data can help determine the appropriate level of granularity to assign the DOI, as well as intention for reuse, versioning, and how the data is used within journal articles, technical reports, or patents.
- DOIs can be assigned for a variety of different forms of data, such as instruments, sensor data, time-sensitive data (for example, monthly datasets for a location, with new DOIs each month), supercomputer runtime data, individual samples, grouped samples, supplemental data

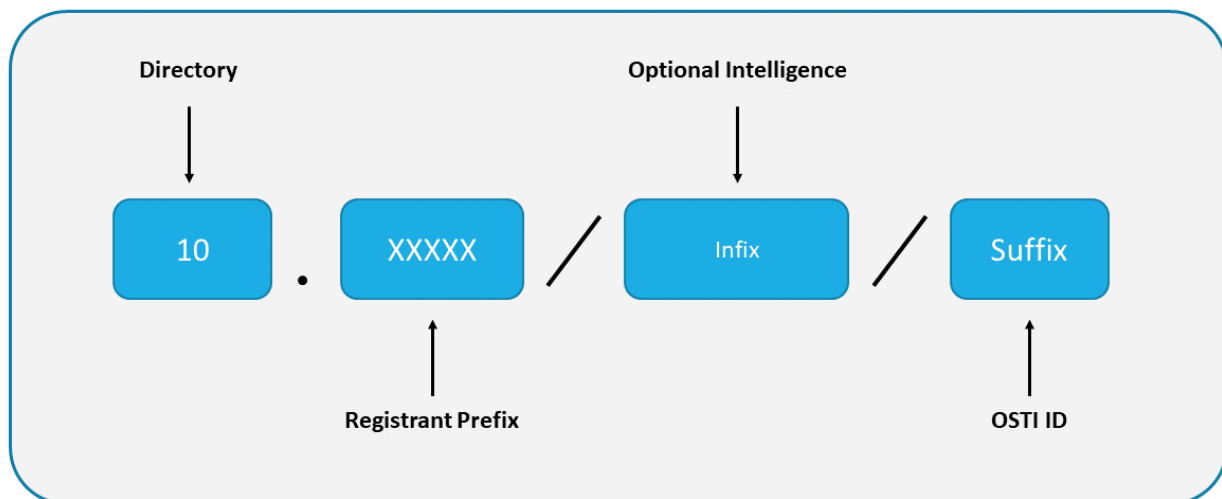
to a journal article, computer models/simulations, photographs, graphics, interactive resources, and more.

1.4 The Digital Object Identifier (DOI)

A DataCite DOI consists of a prefix, infix, and suffix. Each OSTI data client receives a numeric prefix from DataCite, which is specific to that data client.

A DOI **prefix** begins with 10.XXXX, where XXXX is a series of numbers.

(See Figure Below)



The **Infix** is optional and can be incorporated by the data client/submitter. The infix can add intelligence to the DOI by incorporating project, user facility, or other specific identification. The infix must contain 3-50 characters. Characters may **not** be spaces or forward slashes (/).

The **suffix** is assigned by OSTI and is the OSTI ID. Every STI record processed through OSTI receives an OSTI ID.

Once a DOI is registered, it cannot change, but the URL/landing page associated with the DOI can change or be updated as it is part of the metadata associated

with the DOI. DOIs are meant to be persistent, which means submitting organizations should manage and update metadata, including landing pages/URLs as needed for the DOI to properly take the user to the correct page.

This can be accomplished by entering a DOI at: <https://dx.doi.org/>:







Resolve a DOI Name

doi:

Go

Type or paste a [DOI name](#) into the text box. Click Go. Your browser will take you to a Web page (URL) associated with that DOI name.

Or by clicking on the hyperlinked DOI in dataset metadata records found at [OSTI.GOV](https://www.osti.gov/) and [DOE Data Explorer](#):

Dataset	Associated Project	Associated Collections (0)	Other Related Research
<p>DATASET:</p> <div>  View Dataset </div> <div>DOI: 10.15121/1136712</div> <hr/> <p>SAVE / SHARE:</p> <p>Export Metadata ▾</p> <p>Save to My Library</p> <div>      </div>	<p>Abstract</p> <p>Geologic Map of the Patua Geothermal Area</p> <p>Creator(s)/Author(s): Faulds, James E.</p> <p>Publication Date: 2011-10-31</p> <p>Other Number(s): 394</p> <p>DOE Contract Number: EE0002748</p>		

The browser will take the user to a web page (URL) associated with that DOI.

1.5 The Landing Page

A DOI points/resolves to a landing page or URL, which provides information about and access to the dataset. A landing page should contain the following information:

- Full citation metadata of the data object (including the DOI)
- Access information
- Links to software needed to open, view, download or analyze the data
- Update and version information
- Contact information

Below is an example of a landing page:

CXIDB ID 2

Deposition Summary	
Depositor:	Janos Hajdu
Contact:	jan...@xray.bmc.uu.se
Deposition date:	2011-02-02
Last modified:	2011-02-02
DOI:	10.11577/1096904

Publication Details	
Title:	Single mimivirus particles intercepted and imaged with an X-ray laser
Authors:	M. Marvin Seibert, Tomas Ekeberg, Filipe R. N. C. Maia et al.
Journal:	Nature
Year:	2011
DOI:	10.1038/nature09748

Experimental Conditions	
Method:	Single Particle X-ray Diffraction Imaging
Sample:	Mimivirus
Wavelength:	1.033 nm
Lightsource:	LCLS
Beamline:	AMO

Data Files	
Diffraction Pattern:	cxidb-2.cxi (770.64 KB)
Auxiliary Files	
Hawk configuration:	mimi_b.conf (2.12 KB)
Zip package:	mimi_deposit.zip (2.53 MB)
Alternative Formats	
Diffraction Pattern:	cxidb-2.h5 (Hawk HDF5 format) (669.39 KB)
Diffraction Pattern:	cxidb-2.tiff (TIFF format) (1 MB)

Description

These are the files used to reconstruct the images in the paper "Single Mimivirus particles intercepted and imaged with an X-ray laser".

Besides the diffracted intensities, the Hawk configuration files used for the reconstructions are also provided.

The files from CXIDB ID 2 are the pattern and configuration files for the pattern showed in Figure 2b in the paper.

Licensed under the CC0 Public Domain Dedication Waiver.

Please give proper credit via citations according to established scientific practice.

2. Submitting Metadata to Obtain a DOI

2.1 Scientific Research Datasets 241.6 Web Submission Interface

– Single Metadata Record

The 241.6 Web Submission Interface for manual entry of metadata is a good option for low volume data clients. Researchers from DOE national laboratories should contact their site's [STI Manager](#) to arrange for manual submittal.

If a user plans to exclusively submit through the 241.6 Web Submission Interface, then the user does not need to go through Test E-Link first. Work with the Data Liaison by emailing DOEDataID@osti.gov, who will set up a meeting to go through each step of manually submitting.

OSTI prepares a new data client for the 241.6 Web Submission Interface by:

1. Creating a site code in E-Link
2. Assigning a unique DOI prefix to a user's submissions
3. Creating the account at DataCite
4. Creating login credentials on Production E-Link

Financial Assistance recipients (Grantees) can submit metadata for their individual datasets without log-in credentials using the step-by-step version of the Scientific Research Datasets (AN 241.6) Submission Interface found at:

<https://www.osti.gov/elink/2416-submission.jsp>.

For more information about manual submission, please refer to the [E-Link 241.6 Web Submission Interface Instructions](#).

If users have any questions about the submission process, please contact DOEDataID@osti.gov and a member of the OSTI Data Team will answer as soon as possible.

2.2 Application Programming Interface (API)

– Multiple Metadata Records

OSTI offers an Application Programming Interface (API) for POST (submit) and GET (retrieval) functions.

Establishing Test Credentials

To use the production API, users must first submit through Test E-Link before being able to submit in production. In Test E-Link, users can freely practice submissions without the records being shown in OSTI's search products. The Data Ingest Liaison Librarian will work with the user on checking submissions for errors and giving recommendations for improving metadata quality. Once OSTI determines the user has enough experience and a high success rate of submissions, the user will be given production credentials. Before being ready to test submissions to OSTI, the user must obtain the following by contacting

DOEDataID@osti.gov:

1. Site Code - The site code associates the user with their metadata and records by associating credentials to those who wish to receive notification emails concerning the account. These automated emails are sent after each submission and inform the user of the new OSTI ID and the DOI of the submitted record.
2. DOI Prefix –The DOI prefix, beginning with 10., is unique to the site code. Every DOI assigned to the user's datasets by the DOE Data ID Service will begin with this prefix.
3. E-Link Account – Finally, OSTI establishes a Test E-Link account. The E-Link API requires the user to include the credentials in the header of the server's transmission file.

Confirming Test Credentials – New Client/Submitter

Confirm that the Test credentials are working by:

1. Go to Test E-Link/TEST 241.6 web service:
<https://www.osti.gov/elinktest/2416api>
2. A dialog box will appear asking for a username and a password.
3. Enter the username and the password that OSTI has provided to the user.
4. Upon successful sign in, a screen will appear with XML. If so, the user has successfully logged into the Test E-Link account.

Moving from Test Environment to Production

Upon successful testing, the user will now move into E-Link production, where all metadata record submissions are assigned a DOI and will be publicly available through [OSTI.GOV](https://www.osti.gov) and [DOE Data Explorer](#). Please contact DOEDataID@osti.gov to start the transition to production.

Establishing Production Credentials

1. E-Link Account – After successfully submitting test records, OSTI will establish the credentials in production E-Link.
2. Production API Documentation: Production E-Link API documentation can be found at: <https://www.osti.gov/elink/241-6api.jsp>.
3. Production E-Link—The API Root Endpoint for production E-Link:
<https://www.osti.gov/elink/2416api>.

Confirming Successful Record Submission

When a metadata record has been submitted, the client will receive an email detailing whether submission was successful or unsuccessful. If unsuccessful, details will be given on why it failed. Please contact DOEDataID@osti.gov to help

with resolution of any submission issues. An example email of a successfully submitted record will look like this:

Date: 12/30/2019

Number of Records Submitted: 1

Number of Records Successfully Loaded into ELINK: 1 Number of Records Failed: 0

Record Number: 1

OSTI ID: 1164892

Site Code: ORNL-NGEEA

Report Number: NGA183

Title: Active Layer Hydrology in an Arctic Tundra Ecosystem: Quantifying Water Sources and Cycling Using Water Stable Isotopes: Supporting Data Contract Number: DE-AC05-00OR22725 DOI Assigned: 10.5440/1164892

Status: SUCCESS Record updated and put into SUBMITTED status for transmission to DataCite.

Note: A new record successfully added to ELINK is put in SUBMITTED status and will travel to DataCite for DOI minting overnight. If your DOI fails to mint at DataCite, it will remain suspended in a SUBMITTED status in ELINK until the problem is corrected. You will receive an email notification of DataCite's "failure to mint," if that occurs.

A record sent to OSTI with <set_reserved/> in the XML will be automatically put in SAVED status in ELINK. It will NOT travel to DataCite for DOI minting until the record, with the correct OSTI ID included in the XML, is re-sent to OSTI for update and release. The reserve tag must NOT be in the XML record when it is resent, or the record will remain SAVED. It will only be changed to SUBMITTED status when the OSTI ID is present in the XML and the <set_reserved/> tag is NOT present in the XML.

If this record needs to be edited, resubmit the record by supplying the OSTI ID into the data that you submit.

If you have additional questions, refer to <https://www.osti.gov/stip/document/an2416-web-servicepdf>

3. Reserving a DOI

The DOE Data ID Service provides the ability to reserve a DOI. Reserved DOIs are placeholders within the OSTI E-Link ingest system, but are not yet registered at DataCite. Therefore, reserved DOIs will not resolve at <https://dx.doi.org>, and will not be publicly available in OSTI.GOV, DOE Data Explorer, or major commercial search engines such as Google. Reserved DOIs give the researcher the ability to obtain a DOI before a dataset is final or before publication. A user may desire to reserve a DOI in order to add the DOI information to a journal article or a technical report before publication, as receiving a DOI after publication may make

it impossible for the DOI to be included within the publication. Reserving a DOI earlier within the research workflow due to a strong data management plan ensures that obtaining a DOI is not forgotten at the end.

Once a dataset is finalized/published, resubmit the original submission following the instructions found below. This will trigger the DOI to be released to DataCite for registration.

A DOI can be reserved through the 241.6 Web Submission Interface and the API.

Part III: CONTACT INFORMATION

Note: Only datasets publicly available for U.S. and International access may be announced via this AN 241.6. Please ensure that no Protected Personally Identifiable Information (PII) is contained in this record or in the dataset to which it will link.

**CONTACT: (Used for DOI notification and other administrative purposes. This information will not be displayed in public databases.)*

*Name and Position: Jon Doe

*Organization: OSTI

*E-mail: jdoe@osti.gov

Phone:

Save Submit to OSTI
Printable Version

To reserve a DOI in the 241.6 Web Submission Interface: Enter information for all required metadata fields (use placeholder information for what is not yet known), and then click the Save button.

This will generate an OSTI ID.

AN 241.6 - Announcement of USDOE Publicly Available Research Datasets[Announcement Notice 241.6 Instructions](#)*** Required Information**

Note: Before submitting your dataset, please ensure it is located in a data center or other location where it can be maintained for public access indefinitely. The HTML "landing page" or introductory page for the dataset will need to be in place also; the URL for that page is a required piece of information for submittal.

Your save was successful.**OSTI ID: 1476405****Please print this confirmation of your save for your records.****New 241.6 Announcement Notice****OSTI ID:1476405*****SITE CODE:** OSTI (Office of Scientific and Technical Information, Oak Ridge, TN) ▼

The OSTI ID can be used to predict what the reserved DOI will be.

For example, if my site's prefix is 10.0001, and my OSTI ID is 1476405, then my DOI can be predicted to be: 10.0001/1476405.

Once the user is ready to submit the record and obtain a DataCite registered DOI which is indexed and publicly searchable, find the Saved record in E-Link by entering the OSTI ID in the search bar under "Search Announcement Notices" and clicking the Edit button.

SEARCH RESULTS

Searched: OSTI ID is: 1476405 [Refine Search](#)

Sorted by: Relevance **Download Results**

Total results: 1 Record (1 - 1 shown)

Osti ID	Title	Product Type	Report Number	Contract Number	Awardee/ Contractor	Site Code	Publisher Information	Status	Full Text
1476405	Test	Dataset	None	0012704	Albany Research Center (ARC), Albany, OR (United States)	OSTI		Saved	Missing Full-Text

Total results: 1 Record (1 - 1 shown)

Then finish the record with the correct metadata and click Submit to OSTI.

Part III: CONTACT INFORMATION

Note: Only datasets publicly available for U.S. and International access may be announced via this AN 241.6. Please ensure that no Protected Personally Identifiable Information (PII) is contained in this record or in the dataset to which it will link.

***CONTACT:** (Used for DOI notification and other administrative purposes. This information will not be displayed in public databases.)

***Name and Position:** Jon Doe

***Organization:** OSTI

***E-mail:** jdoe@osti.gov

Phone:

Save

Submit to OSTI

Printable Version

To reserve a DOI within the API: Post all required metadata fields (use placeholder information for what is not yet known) and add the metadata field `<set_reserved>true</set_reserved>` to the API submission.

Below is an example of reserving a DOI through the API:

```
<?xml version="1.0" encoding="UTF-8"?><records><record><set_reserved>true</set_reserved><dataset_type>ND</dataset_type><title>AOS (Aerosol Observing System) APS (Aerodynamic Particle Sizer), aosaps.a0</title><contract_nos>DE-AC05-00OR22725</contract_nos><originating_research_org>ARM Data Center, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States)</originating_research_org><language>English</language><country>US</country><sponsor_org>USDOE Office of Science (SC), Biological and Environmental Research (BER)</sponsor_org><contact_name>ARM Data Center User Services</contact_name><contact_phone>888-276-3282</contact_phone><contact_email>armarchive@ornl.gov</contact_email><site_input_code>ORNL-ARM</site_input_code><subject_categories_code>54 Environmental Sciences</subject_categories_code><keywords>aerosol; particle size; concentration</keywords><description>Data from the ARM APS (Aerodynamic Particle Sizer) instrument.</description><file_extension>nc</file_extension><availability>ORNL</availability><contributor_organizations>PNNL, BNL, ANL,
```

```
ORNL</contributor_organizations><contact_org>ORNL</contact_org><source>armobs</source><data_level_code>a0</data_level_code><instrument_code>aosaps</instrument_code><creatorsblock><creators_detail><first_name>John</first_name><last_name>Smith</last_name>creators_detail</creatorsblock></record></records>
```

This will create a reserved DOI but it will be placed in a “Saved” status within E-Link, therefore it will not resolve at <https://dx.doi.org>, and it will not be publicly available in OSTI.GOV, DOE Data Explorer, or major commercial search engines such as Google.

Once ready to submit the finalized record and make the DOI findable, use the OSTI ID and resubmit the API request with the correct metadata and remove the `<set_reserved>true</set_reserved>` field from the submission.

4. Editing DOI Metadata

The DOI string itself cannot be edited/changed after registration. A DOI is persistent, so if using an infix to add intelligence to the DOI, the user should ensure they are satisfied with it, because it is impossible to change it later.

To edit the metadata of a DOI, use either the 241.6 Web Submission Interface or the API. Through both, the changes should appear on the metadata records the day after submission, so long as there are no errors.

To edit the metadata in the 241.6 Web Submission Interface:

For financial assistance recipients (grantees), please contact the E-Link Helpdesk at elink.Helpdesk@osti.gov or 865-576-4070 to have an OSTI staff member edit the record.

For researchers at national laboratories, log into E-Link with your login credentials to edit records. After logging into E-Link, click on Advanced Search, and enter the OSTI ID:

Enter search criteria into **as few or as many** fields as desired.

Sort By ☐ Ascending
☒ Descending
 Title

Search In	For Item(s)	Limit To
OSTI ID	<input type="text" value="1492922"/>	<input type="checkbox"/> Display Only Hidden Records
Report No	<input type="text"/>	<input type="checkbox"/> Display Only Unhidden Records

Then click search. This will show the search results. Click on the Edit button:

SEARCH RESULTS

Searched: OSTI ID is: 1492922 [Refine Search](#)
 Sorted by: Relevance [Download Results](#)
 Total results: 1 Record (1 - 1 shown)

Osti ID	Title	Product Type	Report Number	Contract Number	Awardee/ Contractor	Site Code	Publisher Information	Status	Full Text
1492922	Vision Road Map Reference Database	Dataset	None	AC05-00OR 22725	Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States)	ORNLHYDRO		Completed	View

Total results: 1 Record (1 - 1 shown)

This will bring the user to the 241.6 Web Submission Interface. Make all desired edits and then click on Submit to OSTI:

Part III: CONTACT INFORMATION

Note: Only datasets publicly available for U.S. and International access may be announced via this AN 241.6. Please ensure that no Protected Personally Identifiable Information (PII) is contained in this record or in the dataset to which it will link.

***CONTACT:** (Used for DOI notification and other administrative purposes. This information will not be displayed in public databases.)

*Name and Position:
 *Organization:
 *E-mail:
 Phone:

To edit the metadata via the API: Whenever editing through the API, it is not required to resubmit all metadata for the record, all that is needed is the OSTI ID or Accession Number, and the XML fields that need to be changed.

For example:

```
<records>
<record>
<osti_id>9999</osti_id>
<title>My new title</title>
</record>
</records>
```

In the example, the only metadata that has been edited is the title, and none of the other metadata was needed.

5. Searching for a DOI

After the user has submitted the metadata record to OSTI via the API or the 241.6 Web Submission Interface and the DOI has been registered by DataCite, OSTI will make the metadata record and DOI visible both in [DOE Data Explorer \(DDE\)](#) and [OSTI.GOV](#), and indexed in commercial search engines like Google Dataset Search.

For OSTI.GOV and DDE, search for the OSTI ID or DOI by using the Advanced Search and inserting the identifier either in “Digital Object Identifier (DOI)” or “Identifier Numbers”:

OSTI.GOV U.S. Department of Energy
Office of Scientific and Technical Information

Search 3+ million Department of Energy research results

Submit Research Results Search Tools Public Access Policy Data

OSTI.GOV / Search for All Records (filtered) / Page 1 of 307,659

3,076,589 Search Results

Digital Object Identifier (DOI):
10.15485/1571527

Diffusion dynamics of adsorbate particle coverage. Our molecular dynamics simulation of adsorbate on a flat substrate varies non-linearly with the adsorbate concentration. As the adsorbate becomes stratified into distinct layers, we observe that adsorbate particles in different layers, via different processes, separated by the layer boundaries, specific layer has been introduced, and it

Advanced Search Options
Advanced Search queries use a traditional Term Search. For more info, see our [FAQ](#).

All Fields:

Title:

Author / Contributor:

Digital Object Identifier (DOI):
10.15485/1571527

Identifier Numbers:

Publication Date:
MM/DD/YYYY to MM/DD/YYYY

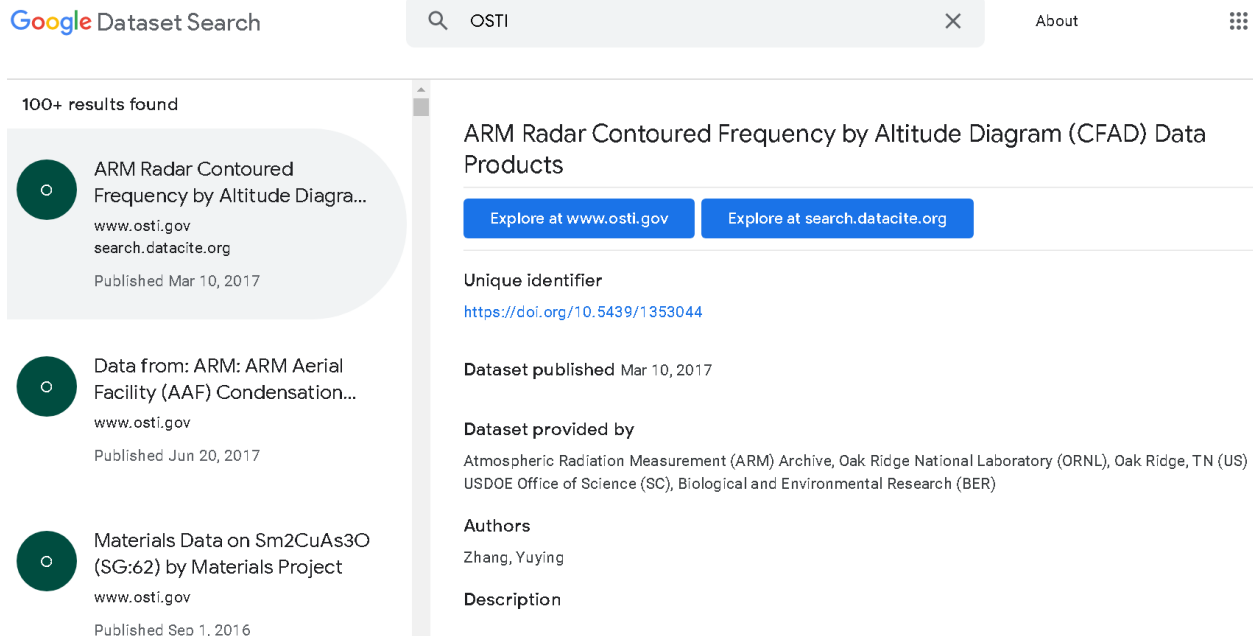
[More Options ...](#)

Search

DOI: 10.1016/j.commatsci.2019.109299

Google Dataset Search

Much like Google and Google Scholar, Google Dataset Search allows users to search and access datasets hosted in thousands of repositories. It currently indexes repositories that use the Schema.org structured data guidelines. OSTI implemented Google's structured data guidelines (largely Schema.org) for datasets, so OSTI datasets are available on the service.



The screenshot shows a Google Dataset Search interface. At the top, there's a search bar with 'OSTI' entered. Below the search bar, it says '100+ results found'. On the left, there's a list of three datasets, each with a circular icon and a title. The first dataset is 'ARM Radar Contoured Frequency by Altitude Diagram (CFAD) Data Products' from 'www.osti.gov' and 'search.datacite.org', published on Mar 10, 2017. The second dataset is 'Data from: ARM: ARM Aerial Facility (AAF) Condensation...' from 'www.osti.gov', published on Jun 20, 2017. The third dataset is 'Materials Data on Sm2CuAs3O (SG:62) by Materials Project' from 'www.osti.gov', published on Sep 1, 2016. On the right, there's a detailed view of the first dataset, 'ARM Radar Contoured Frequency by Altitude Diagram (CFAD) Data Products'. It includes two buttons: 'Explore at www.osti.gov' and 'Explore at search.datacite.org'. Below these buttons, it shows the 'Unique identifier' as 'https://doi.org/10.5439/1353044', the 'Dataset published' date as 'Mar 10, 2017', the 'Dataset provided by' as 'Atmospheric Radiation Measurement (ARM) Archive, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (US) USDOE Office of Science (SC), Biological and Environmental Research (BER)', the 'Authors' as 'Zhang, Yuying', and a 'Description' section.

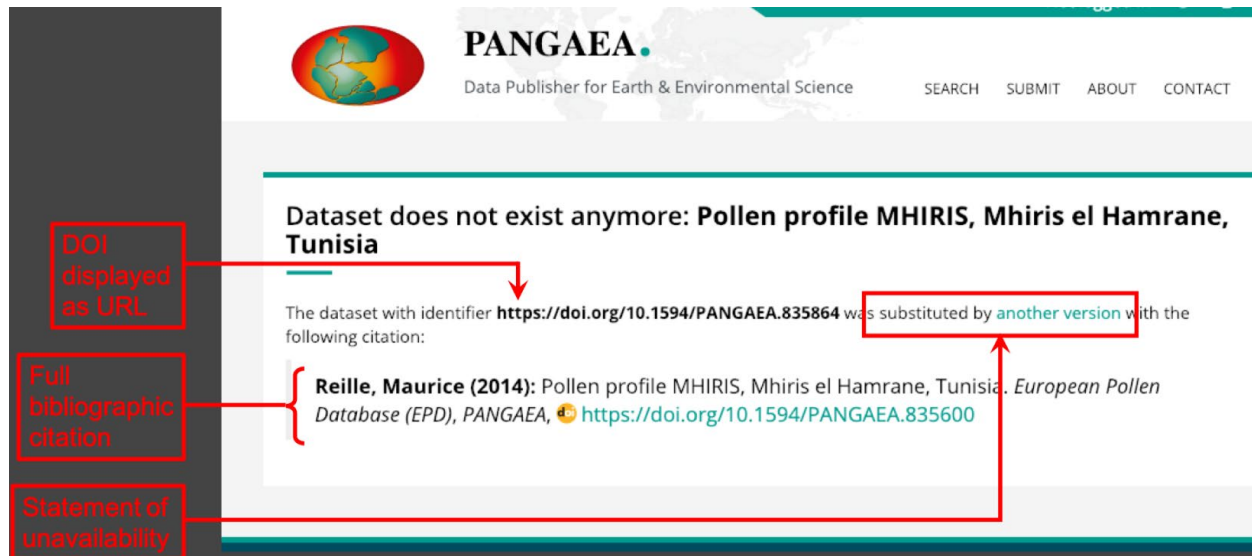
6. Deleting a DOI

A DOI cannot be deleted, as it is a persistent identifier. If the exact DOI is searched in a browser or resolved, it will still point to the landing page. However, if no other alternatives are viable, OSTI can “hide” the DOI and associated metadata record in DOE Data Explorer, OSTI.GOV, and DataCite’s search. Although this is an option, it is seldom necessary.

If the user wishes to hide a DOI, please contact OSTI at DOEDataID@osti.gov and specify the OSTI ID, DOI, and the reason for hiding the DOI.

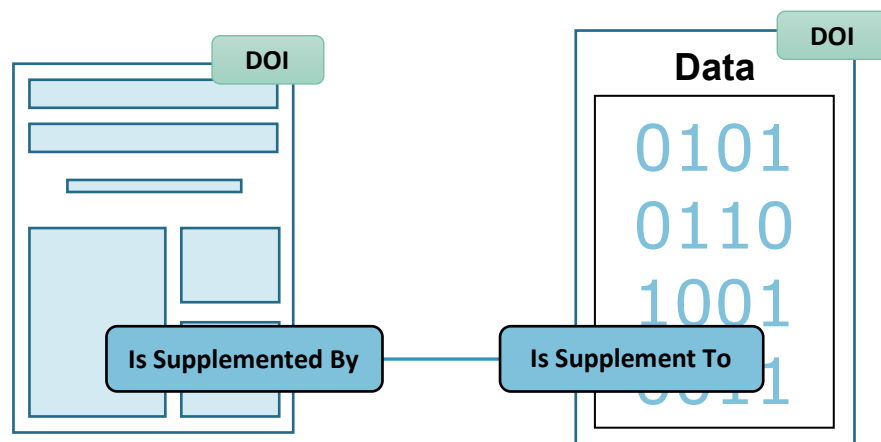
When “hiding” a DOI, the landing page needs to be updated or replaced to indicate the data object is no longer accessible. This required webpage is called a tombstone page. The tombstone page should provide a full bibliographic citation to verify users have found the correct item (or its last resting place). The tombstone page should contain the DOI itself in both a human-readable and machine-readable format. It is best to include a statement of unavailability, a reason for the item’s removal, and the details that led to the current situation. It should be clear to users that the item being described is in fact associated with the DOI they tried to resolve, but that item is now no longer available.

Below is an example given by DataCite of a tombstone page:



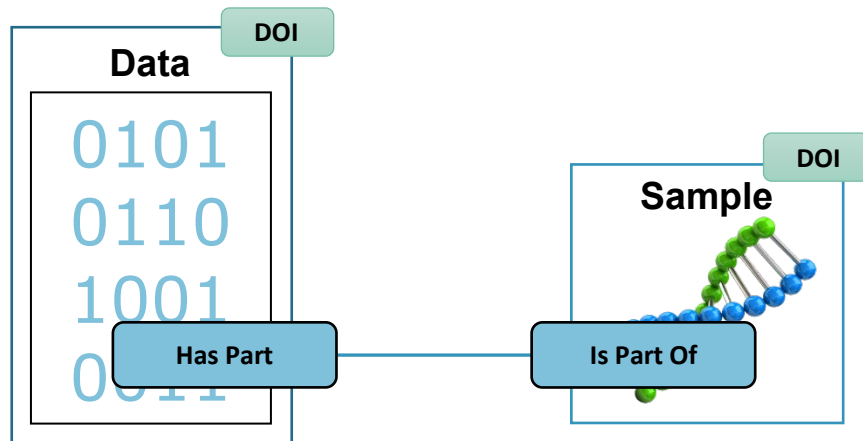
7. Using Related Identifiers

Related identifiers are a way to link data objects with other research objects (journal articles, technical reports, datasets, instruments, experiments, awards, etc.) to give users a fuller picture of how research objects are related or connect to one another. This can help to facilitate the validation of research results and support research reproducibility.



Here a journal article “is supplemented by” a dataset, and the dataset “is supplement to” the journal article.

OSTI recommends using the Related Identifier metadata field to reference previous versions or related data objects, as well as express other relationships to a related source (including journal articles associated with the data object, data sets, figures, software, etc.).



Here a dataset “has part” (contains) an individual data sample, and the individual data sample “is part of” the dataset.

OSTI currently has the following Relation Types:

In all examples below, “A” is always the dataset and “B” is the related object.

Code	Description
Cites	indicates that A includes B in a citation OSTI Guidance: Use this relationship to show what the dataset is citing. Example: <pre><related_identifier>10.1038/sdata.2016.18</related_identifier> <relation_type>Cites</relation_type> <related_identifier_type>DOI</related_identifier_type></pre>
IsCitedBy	indicates that B includes A in a citation OSTI Guidance: Use this relationship to show the research objects which are citing the dataset (such as a journal article, technical report, etc.). Example: <pre><related_identifier>10.2172/1271651</related_identifier> <relation_type>IsCitedBy</relation_type> <related_identifier_type>DOI</related_identifier_type></pre>

Compiles	<p>indicates B is the result of a compile or creation event using A</p> <p>OSTI Guidance: Use this relationship to indicate software or text that compiles/creates B.</p> <p>Example:</p> <pre><relidentifiersblock> <relidentifier_detail relatedIdentifierType="osti_id" relationType="Compiles"> <related_identifier>12345</related_identifier> </relidentifier_detail> <relidentifier_detail relatedIdentifierType="doi" relationType="Compiles"> <related_identifier>10.5072/dataset/283</related_identifier> </relidentifier_detail> <relidentifier_detail relatedIdentifierType="accession_num" relationType="Compiles"> <related_identifier>my-data-set-001</related_identifier> </relidentifier_detail></pre>
IsCompiledBy	<p>indicates B is used to compile or create A</p> <p>OSTI Guidance: Use this relationship to indicate that A is being compiled/created by a specific software or text.</p> <p>Example:</p> <pre><related_identifier>http://d-nb.info/gnd/4513749-3</related_identifier> <relation_type>IsCompiledBy</relation_type> <related_identifier_type>URL</related_identifier_type></pre>
Continues	<p>indicates A is a continuation of the work B</p> <p>OSTI Guidance: Use this relationship to show that a work is the direct continuation of another work, and thus they need to be viewed together to fully comprehend.</p> <p>Example:</p> <pre><related_identifier>10.34664/1575430</related_identifier> <relation_type>Continues</relation_type> <related_identifier_type>DOI</related_identifier_type></pre>
IsContinuedBy	<p>indicates A is continued by the work B</p> <p>OSTI Guidance: Use this relationship to show that a work is continued by another work, and thus they need to be viewed together to fully comprehend.</p> <p>Example:</p> <pre><related_identifier>10.34664/1575430</related_identifier> <relation_type>IsContinuedBy</relation_type> <related_identifier_type>DOI</related_identifier_type></pre>

Documents	<p>indicates A is documentation about/B</p> <p>OSTI Guidance: Use this relationship to show that a work documents (such as software documentation) another work to show how it operates or how to use it.</p> <p>Example: <code><related_identifier>10.34664/1575430</related_identifier></code> <code><relation_type>Documents</relation_type></code> <code><related_identifier_type>DOI</related_identifier_type></code></p>
IsDocumentedBy	<p>indicates B is documentation about/explaining A</p> <p>OSTI Guidance: Use this relationship to show that a work is documented (such as software documentation) by another work to show how it operates or how to use it.</p> <p>Example: <code><related_identifier>10.2172/1572938</related_identifier></code> <code><relation_type>IsDocumentedBy</relation_type></code> <code><related_identifier_type>DOI</related_identifier_type></code></p>
HasMetadata	<p>indicates resource A has additional metadata B</p> <p>OSTI Guidance: Use this relationship to show that another work contains additional metadata about A.</p> <p>Example: <code><related_identifier>10.1234/567890</related_identifier></code> <code><relation_type>HasMetadata</relation_type></code> <code><related_identifier_type></related_identifier_type></code></p>
IsMetadataFor	<p>indicates additional metadata A for a resource B</p> <p>OSTI Guidance: Use this relationship to show that a work contains additional metadata about another work.</p> <p>Example: <code><related_identifier>10.1234/567890</related_identifier></code> <code><relation_type>IsMetadataFor</relation_type></code> <code><related_identifier_type></related_identifier_type></code></p>
HasPart	<p>indicates A includes the part B</p> <p>OSTI Guidance: Use this relationship to show container-contained type relationships and for elements of a series, such as for collections of datasets outside of OSTI.</p> <p>Example: <code><related_identifier>https://zenodo.org/record/16564/files/dune-stuff-LSSC_15.zip</related_identifier></code></p>

	<pre> <relation_type>HasPart</relation_type> <related_identifier_type>URL</related_identifier_type> </pre>
IsPartOf	<p>indicates A is a portion of B; may be used for elements of a series</p> <p>OSTI Guidance: Use this relationship to show container-contained type relationships and for elements of a series, such as for collections of datasets outside of OSTI.</p> <p>Example:</p> <pre> <related_identifier>10.5281/zenodo.754312</related_identifier> <relation_type>IsPartOf</relation_type> <related_identifier_type>DOI</related_identifier_type> </pre>
IsDerivedFrom	<p>indicates B is a source upon which A is based</p> <p>OSTI Guidance: Use this relationship to show a resource that is a derivative of an original resource. In the example below, the dataset is derived from a larger dataset and data values have been manipulated from their original state.</p> <p>Example:</p> <pre> <related_identifier>10.6078/M7DZ067C</related_identifier> <relation_type>IsDerivedFrom</relation_type> <related_identifier_type>DOI</related_identifier_type> </pre>
IsIdenticalTo	<p>indicates that A is identical to B, for use when there is a need to register two separate instances of the same resource</p> <p>OSTI Guidance: Use this relationship to show a resource that is the same as the registered resource but is saved on another location, maybe another institution.</p> <p>Example:</p> <pre> <related_identifier>10.34664/1575678</related_identifier> <relation_type>IsIdenticalTo</relation_type> <related_identifier_type>DOI</related_identifier_type> </pre>
IsNewVersionOf	<p>indicates A is a new edition of B, where the new edition has been modified or updated</p> <p>OSTI Guidance: Use this relationship to show that the work is a newer/updated version of another work.</p> <p>Example:</p> <pre> <related_identifier>10.5281/zenodo.800648</related_identifier> <relation_type>IsNewVersionOf</relation_type> <related_identifier_type>DOI</related_identifier_type> </pre>
IsPreviousVersion Of	<p>indicates A is a previous edition of B</p> <p>OSTI Guidance: Use this relationship to show that the work is an older/previous version of another work.</p>

	<p>Example:</p> <pre><related_identifier>10.5281/zenodo.60943</related_identifier> <relation_type>IsPreviousVersionOf</relation_type> <related_identifier_type>DOI</related_identifier_type></pre>
IsOriginalFormOf	<p>indicates A is the original form of B</p> <p>OSTI Guidance: Use this relationship to show that a work is the original form of another, such as for different software operating systems or compiler formats.</p> <p>Example:</p> <pre><related_identifier>10.6078/M7DZ067C</related_identifier> <relation_type>IsOriginalFormOf</relation_type> <related_identifier_type>DOI</related_identifier_type></pre>
IsSourceOf	<p>indicates A is a source upon which B is based</p> <p>OSTI Guidance: Use this relationship to show a work is the original resource from which a derivative resource was created. In the example below, this is the original dataset without value manipulation, and the source of the derived dataset.</p> <p>Example:</p> <pre><related_identifier>http://opencontext.org/projects/81204AF8-127C-4686- E9B0-1202C3A47959</related_identifier> <relation_type>IsSourceOf</relation_type> <related_identifier_type>URL</related_identifier_type></pre>
IsSupplementedBy	<p>indicates that B is a supplement to A</p> <p>OSTI Guidance: Use this relationship to show that another work is supplementing this work. For example, for a journal article, the supplemental figures and tables located in a separate file would be supplementing the journal article.</p> <p>Example:</p> <pre><related_identifier>https://static- content.springer.com/esm/art%3A10.1038%2Fnature08275/MediaObjects/4158 6_2009_BFnature08275_MOESM269_ESM.pdf</related_identifier> <relation_type>IsSupplementedBy</relation_type> <related_identifier_type>URL</related_identifier_type></pre>
IsSupplementTo	<p>indicates that A is a supplement to B</p> <p>OSTI Guidance: Use this relationship to show that this work is supplementing another work. For example, for a journal article, the supplemental figures and tables located in a separate file would be supplementing the journal article.</p> <p>Example:</p> <pre><related_identifier>10.1038/nature08275</related_identifier> <relation_type>IsSupplementTo</relation_type></pre>

	<code><related_identifier_type>DOI</related_identifier_type></code>
IsVariantFormOf	<p>indicates A is a variant or different form of B</p> <p>OSTI Guidance: Use this relationship to show that this work is a variant form of another work, such as a variant calculated or calibrated form or different packaging, different software operating systems or compiler formats.</p> <p>Example: <code><related_identifier>10.6078/M7DZ067C</related_identifier></code> <code><relation_type>IsVariantFormOf</relation_type></code> <code><related_identifier_type>DOI</related_identifier_type></code></p>
Obsoletes	<p>indicates that A obsoletes B</p> <p>OSTI Guidance: Use this relationship to show that this work renders another work obsolete, perhaps due to the other work having inaccurate or old data.</p> <p>Example: <code><related_identifier>10.5438/bmjt-bx77</related_identifier></code> <code><relation_type>Obsoletes</relation_type></code> <code><related_identifier_type>DOI</related_identifier_type></code></p>
IsObsoletedBy	<p>indicates that A is obsoleted by B</p> <p>OSTI Guidance: Use this relationship to show that this work is rendered obsolete by another work, perhaps due to the work having inaccurate or old data.</p> <p>Example: <code><related_identifier>10.14454/7xq3-zf69</related_identifier></code> <code><relation_type>IsObsoletedBy</relation_type></code> <code><related_identifier_type>DOI</related_identifier_type></code></p>
References	<p>indicates B is used as a source of information for A</p> <p>OSTI Guidance: Use this relationship to show that this work references another work as a source of information. This is broader than citing, because references can appear anywhere throughout a work, not just in a citation or bibliography section.</p> <p>Example: <code><related_identifier>10.18141/1427300</related_identifier></code> <code><relation_type>References</relation_type></code> <code><related_identifier_type>DOI</related_identifier_type></code></p>
IsReferencedBy	<p>indicates A is used as a source of information by B</p> <p>OSTI Guidance: Use this relationship to show that this work is referenced by another work as a source of information. This is broader than citing, because references can appear anywhere throughout a work, not just in a citation or bibliography section.</p>

	<p>Example:</p> <pre><related_identifier>10.5440/1362279</related_identifier> <relation_type>IsReferencedBy</relation_type> <related_identifier_type>DOI</related_identifier_type></pre>
Reviews	<p>indicates that A is a review of B</p> <p>OSTI Guidance: Use this relationship to show that this work reviews another work, such as a book review, journal comment, or peer review.</p> <p>Example:</p> <pre><related_identifier>10.12688/f1000research.4001.1</related_identifier> <relation_type>Reviews</relation_type> <related_identifier_type>DOI</related_identifier_type></pre>
IsReviewedBy	<p>indicates that A is reviewed by B</p> <p>OSTI Guidance: Use this relationship to show that this work is reviewed by another work, such as a book review or journal comment.</p> <p>Example:</p> <pre><related_identifier>10.5256/F1000RESEARCH.4288.R4745</related_identifier> <relation_type>IsReviewedBy</relation_type> <related_identifier_type>DOI</related_identifier_type></pre>

For more technical API information on related identifiers, please refer to the [E-Link 241.6 API Documentation](#).

Example of Related Identifier Entry in the 241.6 Web Submission Interface:

Add/Remove Related Identifiers/DOIs

You may add DOIs to reference other papers, datasets, or software that relate to the STI product you are submitting/announcing with this record. The STI product you are currently submitting/describing/announcing with this record is always considered Item A. The related DOI is always considered Item B. When cross-referencing with the "how related" controlled vocabulary, the virtual sentence structure you want to create is "Item A (is related in this way to) Item B".

This STI product (Item A)

IsPartOf

DOI

✕ Delete

This STI product (Item A)

IsPreviousVersionOf

DOI

✕ Delete

This STI product (Item A)

References

DOI

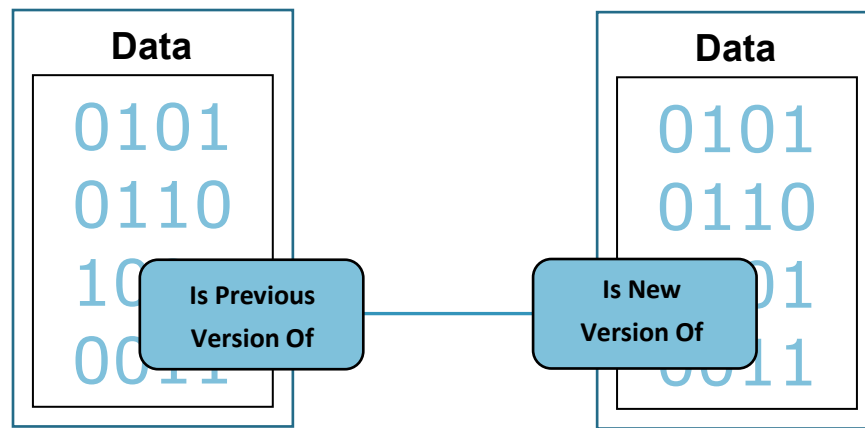
✕ Delete

+ Add Another

Example of Related Identifier Entry in the API:

```
<relidentifiersblock>
<relidentifier_detail>
  <related_identifier>10.5072/238923</related_identifier>
  <relation_type>Cites</relation_type>
  <related_identifier_type>DOI</related_identifier_type>
</relidentifier_detail>
<relidentifier_detail relationType="References" relatedIdentifierType
="DOI">
  <related_identifier>10.5072/science/2019/18-200</related_identifier>
</relidentifier_detail>
<!-- optionally more details -->
</relidentifiersblock>
```

8. Versioning: Assigning DOIs to Data Object Versions



OSTI recommends that a new DOI be registered when a major version change occurs in a data object. There are two ways to ensure that users know which version of a dataset is being retrieved.

1. Include the version number as a part of the dataset title.

FRAMES Metadata Reporting Templates for Ecohydrological Observations, version 1.1

Christianson, Danielle ; Varadharajan, Charuleka ; Christoffersen, Brad ; ...

FRAMES is a set of Excel metadata files and package-level descriptive metadata that are designed to facilitate and improve capture of desired metadata for ecohydrological observations. The metadata are bundled with data files into a data package and submitted to a data repository (e.g. the NGEE Tropics Data Repository) via a web form. FRAMES standardizes reporting of diverse ecohydrological and biogeochemical data for synthesis across a range of spatiotemporal scales and incorporates many best data science practices. This version of FRAMES supports observations for primarily automated measurements collected by permanently located sensors, including sap flow (tree water use), leaf [more »](#)

2. Provide a version number/identifier in the infix of the DOI.

Please remember an infix cannot be edited.

Example: 10.11111/ver1.5/1111111

We recommend using the Related Identifier metadata field to reference previous versions, as well as express other relationships to a related source (including journal articles associated with the data object, data sets, figures, software, etc.):

```
<reidentifier_detail>
```

```
<related_identifier>10.11111/1111111</related_identifier>
```

```
<relation_type> IsNewVersionOf</relation_type>
```

```
<related_identifier_type>DOI</related_identifier_type>
```

9. Creating a Unique DOI Infix

To add intelligence to a DOI, such as identifying a specific project/instrument/research group/etc., use the infix API tag:

`</doi_infix>` with the specific identifier the user wants to express.

Example:

```
<doi_infix>MyProjectName</doi_infix>
```

Or, within the 241.6 Web Submission Interface:

A DOI will be assigned to your dataset by OSTI. If you wish to include an alphanumeric string, enter it here:
(No more than 50 characters)

Added to the required metadata fields will result in a DOI like this:

10.1234/MyProjectName/123456

If no `</doi_infix>` is submitted, the same metadata submission will result in a DOI like this:

10.1234/123456

Appendix: DOE Data ID Service API Metadata

The following table lists the required and optional metadata fields, XML tags and the additional information. Records submitted without required fields will result in a FAILURE notification.

*OSTI ID—an OSTI ID is given to a new record (POST) in the API and also through the Web Submission Interface, and the OSTI ID can be used to search for the record in E-Link or the API. The OSTI ID is in the suffix of the DOI. Use `</osti_id>` only when using GET function and when editing/updating the existing record. OSTI provides [API documentation](#) for searching DOE Data Explorer.

Metadata Schema

Required fields Shaded		
	Field Name and XML Tag	Additional Information
1*	OSTI ID <code></osti_id></code>	New records are assigned an OSTI ID in the suffix. To edit/update records, the user must include the <code></osti_id></code> tag.
2	Dataset Type <code></dataset_type></code>	Main content of the dataset; AS—Animations/Simulations GD—Genome/Genetic Data IM—Interactive Data Map ND—Numeric Data IP—Still Images/Photos FP—Figures/Plots SM—Specialized Mix MM—Multimedia A—Award I—Instrument Ex: <code><dataset_type>ND</dataset_type></code>
3	Title <code></title></code>	Full title of the dataset

4	Creator(s)/Principal Investigator(s)/Authors <creatorsblock> <creators_detail> <first_name></first_name> <middle_name></middle_name> <last_name></last_name> <affiliation_name></affiliation_name> <private_email></private_email> <orcid_id></orcid_id> </creators_detail> </creatorsblock>	<pre> <creatorsblock> <creators_detail> <first_name>J.</first_name> <middle_name>Robert</middle_name> <last_name>Oppenheimer</last_name> <affiliation_name>UCBerkeley</affiliation_name> <private_email>jopp@ucberkeley.edu</private_email> <orcid_id>0000000000000000</orcid_id> </creators_detail> </creatorsblock> </pre> <p>*For orcid_id, use 16-digit number only</p>
5	Dataset Product Number(s) </product_nos>	Identifying number; "none" is acceptable.
6	DOE Contract Number(s) </contract_nos>	Omit "DE" from contract number.
7	Originating Research Organization </originating_research_org>	<p>See: https://www.osti.gov/elink/authorities.js</p> <p>For a list of Originating Research Organizations. Multiple organizations can be listed, separated by a semicolon and a space.</p>
8	Publication/Issue Date </publication_date>	Accepted formats: <ul style="list-style-type: none"> • mm/dd/yyyy • yyyy Month • yyyy

9	Language </language>	Default to English. See: https://www.osti.gov/elink/authorities.jsp for other language values.
10	Country of Origin/Publication </country>	Default to U.S.; See: https://www.osti.gov/elink/authorities.jsp for other values.
11	Sponsoring Organization(s) </sponsor_org>	See: https://www.osti.gov/elink/authorities.jsp for values Multiple organizations can be listed, separated by a semicolon and a space.
12	Site URL </site_url>	URL that links to the landing page.
13	Contact Name and Position </contact_name>	Internal tag for OSTI records only; will not be publicly displayed.
14	Contact e-mail </contact_email>	Internal tag for OSTI records only; will not be publicly displayed.
15	Contact phone </contact_phone>	Internal tag for OSTI records only; will not be publicly displayed.
16	Site Code </site_input_code>	The Site Code that owns this particular dataset; it will default to logged-in user's primary Site if not set. User must have appropriate privileges to submit records to this Site. <site_input_code>DRHUB</site_input_code>

17	Site Accession Number </accession_num>	Site specific unique identifier for this dataset.
18	Contributor(s) </contributors> </contributor> </first_name> </last_name> </affiliation_name> </contributorType> </private_email> </orcid_id>	<p>Example:</p> <pre> <contributors> <contributor> <first_name>J.</first_name> <last_name>Oppenheimer</last_name> <affiliation_name>UCBerkeley</affiliation_name> <contributorType>Researcher</contributorType> <private_email>jopp@ucberkeley.edu</private_email> <orcid_id>0000-0000-0000-0000</orcid_id> </contributor> </contributors> </pre> <p>*For orcid_id, use 16-digit number only</p>
19	Other Identifying Number(s) </other_identifying_numbers>	Any numbers that identify the data. Separate multiple values by a semicolon and a space.
20	Subject Categories </subject_categories_code>	See : https://www.osti.gov/elink/authorities.jsp for values. Separate multiple values by a semicolon and a space.
21	Keywords </keywords>	Words or phrases to describe the dataset. Separate multiple values by a semicolon and a space.
22	Description </description>	Define the content of the dataset.

23	DOI </doi>	Use only if dataset already has a DOI.
24	Dataset File Extension </file_extension>	Examples: .txt; .csv; .ps
25	Software needed to utilize the dataset </software_needed>	Software tools required to utilize the dataset.
26	Dataset Size </dataset_size>	Indicate file size and/or number of files.
27	DOI Infix </doi_infix>	Character string decided on by submitter. <50 characters; no spaces or / Ex: <doi_infix>Project1.3</doi_infix> Results in: 10.1234/Project1.3/123456
28	Set Reserve </set_reserved>	This puts E-Link record in SAVED status to reserve the DOI.
29	Other non-DOE Number(s) </othnondoe_contract_nos>	Any award numbers relevant but not associated with DOE. Separate multiple values by a semicolon and a space.
30	Related Identifier(s) <relidentifiersblock> <relidentifier_detail> <related_identifier_type> <relation_type> </relidentifier_detail> </relidentifiersblock>	DOI is used as the related identifier of the dataset. A controlled vocabulary list expresses the relationship. Please see Appendix for controlled vocabulary. Ex: <relidentifiersblock> <relidentifier_detail> <related_identifier_type>DOI</related_identifier_type>

		<pre><related_idenfier>10.1234/Project1.3/1 23456</related_idenfier> <relation_type>IsPreviousVersionOF</ relation_type> </ relidentifier_detail> </ relidentifiersblock></pre> <p>In this example, the dataset being submitted is a previous version of another dataset that has received a DOI.</p>
31	<p>Geolocation Place Name</p> <pre><geolocations> <geolocation> <place></place> </geolocation> </geolocations></pre>	<p>Name of the place where the data were collected.</p> <p>Ex:</p> <pre><geolocations> <geolocation> <place>Oak Ridge</place> </geolocation> </geolocations></pre>
32	<p>Geolocation Point</p> <pre><geolocations> <geolocation> <point latitude="number"longitude ="number"> </geolocation> </geolocations></pre>	<p>Ex:</p> <pre><geolocations> <geolocation> <point latitude= "36.0104"longitude="84.2696"> </geolocation> </geolocations></pre>
33	<p>Geolocation Bounding Box</p> <pre><geolocations> <geolocation> <boundingBox> <northLatitude> <southLatitude> <eastLongitude></pre>	<p>Expressing 4 points in a square (box).</p> <p>Ex:</p> <pre><geolocations> <geolocation> <boundingBox></pre>

	<pre> <westLongitude </geolocation> </geolocations> </pre>	<pre> <northLatitude>+36.067428</northLatitude> <southLatitude>-35.849496</southLatitude> <eastLongitude>+83.688549</eastLongitude> <westLongitude>-84.161622</westLongitude> </boundingBox> </geolocation> </geolocations> </pre>
34	<pre> Geolocation Polygon </polygon> </pre>	<p>Irregular geolocation. 3 or more points. Ex:</p> <pre> <geolocations> <geolocation> <polygon> <point latitude= "36.597"longitude="-81.606"> <point latitude= "36.650"longitude="-88.044"> <point latitude= "36.491"longitude="-88.066"> <point latitude= "36.456"longitude="-89.450"> <point latitude= "34.994"longitude="-90.353"> </polygon> </geolocation> </geolocations> </pre>

Appendix: 241.6 Web Submission Interface Submission Example

OSTI ID:1548406
RECORD VERSION: ☐ Revised Product ☒ Revised Announcement
*SITE CODE:

Part I: STI PRODUCT DESCRIPTION

*DATASET TYPE: (Select the choice that best describes dataset's main content)

*DATASET TITLE:

Preview Title

* AUTHOR(S) AND CONTRIBUTOR(S)

Show entries Find Authors to Edit:

#	Name	ORCID iD	Affiliation	Contributor Type	Action
1	Anjana Devanand	0000000194223894	Indian Institute of Technology Bombay, Pacific Northwest National Laboratory		
2	Maoyi Huang		Pacific Northwest National Laboratory		
3	Moetasim Ashfaq		Oak Ridge National Laboratory		
4	Beas Barik		Indian Institute of Technology Bombay		
5	Subimal Ghosh		Indian Institute of Technology Bombay		

Site Code: A site code will be created for you based on what data center the data belongs to.

Dataset Type: This is a dropdown with the following options: Animations/Simulations, Award, Figures/Plots, Genome/Genetics Data, Instrument, Interactive Data Map(s), Multimedia, Numeric Data, Specialized Mix, Still Images or Photos. Above, Specialized Mix was chosen (often this is chosen if there is a mix of different dataset types).

Dataset Title: This is the title of your dataset based on the title found on the landing page.

Author(s) and Contributor(s): A listing of the authors/contributors to the dataset.

RELATED RESOURCE: *(Enter the full citation of a publication that is supplemented by this dataset, software, or research object you are currently submitting/announcing to OSTI with this record.)*

Add/Remove Related Identifiers/DOIs

You may add DOIs to reference other papers, datasets, or software that relate to the STI product you are submitting/announcing with this record. The STI product you are currently submitting/describing /announcing with this record is always considered Item A. The related DOI is always considered Item B. When cross-referencing with the "how related" controlled vocabulary, the virtual sentence structure you want to create is "Item A (is related in this way to) Item B".

This STI product (Item A)

[is related in this way to] ▼

DOI

✕ Delete

+ Add Another

A DOI will be assigned to your dataset by OSTI. If you wish to include an alphanumeric string, enter it here: (No more than 50 characters)

STI PRODUCT IDENTIFIERS: (Separate multiples with semicolons)

* **Dataset Product Number(s):**

* **DOE Contract/Award Number(s):** DE -

Other non-DOE Contract/Award Number(s):

Other Identifying Number(s):

***ORIGINATING RESEARCH ORGANIZATION:**

[Select Primary First] ▼

Pacific Northwest National Laboratory 2; PNNL

Availability: (Refer request to [if applicable])

COLLABORATION NAME(S):

*** PUBLICATION/ISSUE DATE:**

08/09/2019

Clear Date

☒ ***Formatted Date:** (MM/DD/YYYY)

OR ☐ ***Publication/Issue Year:** (YYYY) **Time Period:**

Refresh

Related Resource: Citation information about the related journal publication can be entered here. (Optional)

Add/Remove Related Identifiers/DOIs: Here you can add related URLs and DOIs to the dataset (such as related datasets, publications, etc). (Optional)

DOI Alphanumeric String: If you want to personalize the infix of your DOI, you can add that information here. (Optional)

Dataset Product Numbers: Here you would add important product numbers related to the dataset, such as project ID, instrument ID, etc.

DOE Contract/Award Number(s): A contract/award number is required.

Other non-DOE Contract/Award Number(s): If there are other award numbers associated with this dataset that are not DOE, you can add them here. (Optional)

Other Identifying Number(s): If there are other identifying numbers you would like to add, these can be entered here. (Optional)

Originating Research Organization: This would be the name of the laboratory/facility associated with the dataset.

Availability: Availability information can be added here (such as copyright information). (Optional)

Collaboration Name(s): If there are any collaborations associated with the dataset, those can be mentioned here. (Optional)

Publication/Issue Date: Enter here the date of the dataset submission on your landing page.

LANGUAGE:
 [Select Non-English Language] ▼
 EN

COUNTRY OF PUBLICATION:
 United States ▼

***SPONSORING ORGANIZATION(S):** (Select DOE sponsors; add text for other sponsors below)
 [Select Primary First] ▼
 SC

SUBJECT CATEGORIES: clear categories
 [Select Primary First] ▼
 58 GEOSCIENCES

Keywords:
 Irrigation; Paddy; Water use

GEOLOCATION DATA: (Click on a row below to Edit or Delete Geolocation)

Name	Type	Points
No data available in table		

Showing 0 to 0 of 0 entries

Add Geolocation Clear Reset

DESCRIPTION/ABSTRACT:
 The dataset consists of NetCDF files containing irrigation and paddy field input data for WRF-CLM4 simulations over South Asia for years 1990 to 2014. The fields are the irrigation water use for paddy and non-paddy crops and the fraction of water use coming from ground and surface water sources. The files also contain grid cell area fractions of irrigated crops, irrigation paddy crops, and rainfed paddy crops. The dataset is created by combining the global map of irrigated area dataset, irrigation water use estimation of Huang et al. (2018) and agricultural census based estimates over northern India.

Preview Description

Language: Select the language of the dataset (automatically set to English). (Optional)

Country of Publication: Automatically set to the United States, but this can be changed if needed.

Sponsoring Organization(s): There is a dropdown box here with a list of DOE Sponsoring Organizations, such as USDOE Office of Science (SC).

Subject Categories: You can assign subjects based on a dropdown box. You can add multiple. (Optional)

Keywords: Keywords can be added to supplement the subject categories. (Optional)

Geolocation Data: Geolocation data can be added here. (Optional)

Description/Abstract: A paragraph about the dataset can be entered here. (Optional)

Part II: DATASET LOCATION/TECHNICAL SPECIFICATIONS

***URL:** (where the landing page for the dataset is posted for access - the landing page must then provide a direct link to the dataset)

Digital Object Identifier (if already assigned):

Dataset's File Extension:

Software needed to utilize dataset (if applicable):

Dataset Size: (Approximate number of files/items; Kb/Mb)

Part III: CONTACT INFORMATION

Note: Only datasets publicly available for U.S. and International access may be announced via this AN 241.6. Please ensure that no Protected Personally Identifiable Information (PII) is contained in this record or in the dataset to which it will link.

***CONTACT:** (Used for DOI notification and other administrative purposes. This information will not be displayed in public databases.)

***Name and Position:**

***Organization:**

***E-mail:**

Phone:

URL: The link to the landing page of the dataset must be entered here.

Digital Object Identifier (if already assigned): If you already have the DOI, enter it here. Otherwise, this will be automatically generated upon submission by OSTI.

Dataset's File Extension: Enter file extension here. (Optional)

Software needed to utilize dataset (if applicable): If specific software is needed, it can be mentioned here. (Optional)

Dataset Size: The number of files and the approximate size combined. (Optional)

Contact Information: The name, organization, and email of the submitter must be added. A phone number is optional.

Appendix: Frequently Asked Questions (FAQs)

1. How can I get a DOI for my data from OSTI?

OSTI provides two options for obtaining a DOI for data funded by the Department of Energy.

OSTI provides a [Web Submission Interface](#) through E-Link (a tool developed and maintained by OSTI for the submission of scientific and technical information products and metadata) for obtaining DOIs for data objects. As OSTI does not maintain a data repository, only the metadata describing your data will be submitted through the Web Submission Interface.

OSTI also provides the [E-Link 241.6 Application Programming Interface \(API\)](#) as another option for obtaining DOIs for data objects. The API is HTTP-based and can be accessed using a wide variety of clients (Postman; HTTP Requestor; Restlet API, </>RESTED, etc); most examples are illustrated using the cURL command to demonstrate basic use cases.

2. How is OSTI able to provide DOIs for DOE-funded data objects?

OSTI is a member of [DataCite](#), which gives us the ability to assign DOIs to data objects. DataCite employs a metadata schema that allows for the description of data objects. DOE OSTI collects relevant metadata required to obtain a DOI and passes that metadata on to DataCite allowing for a DOI to be minted by DataCite and registered globally through the [International DOI Foundation](#).

DataCite is an international organization that supports data visibility, ease of data citation in scholarly publications, data preservation and future re-use, and data access and retrievability. DataCite members help achieve these goals by assigning persistent identifiers such as DOIs to data objects. Though there are costs associated with assigning DOIs through our DataCite membership, DOE OSTI provides DOI assignment services free to all DOE-funded data objects.

DataCite is a registration agency of the International DOI Foundation, allowing DataCite DOIs to be registered internationally, giving them global recognition and persistence. The DOI system created by the International DOI Foundation was adopted as International Standard ISO 26324.

3. What are the minimum steps to get a DOI?

If you are from a DOE laboratory or user facility:

- o Provide a new site code specific to the data center.

Work with OSTI Data Liaison to:

- Determine if you need to acquire a unique DOI prefix for your DOIs
 - If you will use the API:
 - obtain Test E-Link Account to test submissions
 - obtain Prod E-Link Account
 - If you will use the Web Submission Interface:
 - obtain Prod-E-Link account
- Submit minimal required fields to E-Link to obtain a DOI.

If you are using the grantee Web Submission Interface:

- Go to <https://www.osti.gov/mlink/2416-submission.jsp>
- Fill out the required metadata fields
- Submit the record

4. What metadata describing your data objects is required for obtaining a DOI?

DOE Minimum Required Fields:

- Dataset Type: Type of the main content of the dataset. This is a dropdown with the following options: Animations/Simulations, Award, Figures/Plots, Genome/Genetics Data, Instrument, Interactive Data Map(s), Multimedia, Numeric Data, Specialized Mix, Still Images or Photos.
- Title: Full title of the dataset, with version numbers and date ranges if applicable.
- Author/Contributor: A listing of the authors/contributors to the dataset. Affiliations and ORCIDs can be added if known. If a contributor is listed, the contributor type must be specified.
- Publication Date: The dataset publication date, in mm/dd/yyyy, yyyy, or yyyy Month format.
- Site URL: Full URL to the landing page for this dataset.
- DOE Contract Number(s): Primary DOE contract number(s), multiple values may be separated by a semicolon.
- Dataset Product Number(s): The most important identifying numbers given to the dataset by the host or originating organization.

- **Originating Research Organization:** The organization name primarily responsible for conducting the research.
- **Sponsoring Organization:** The organization name that sponsored/funded the research.
- **Contact Information:** Name, phone number, and email address of a contact person for this dataset. This is for internal use only and will not be displayed publicly.

Many optional fields are available to increase the findability of dataset metadata records. Please refer to the Appendix of the manual for the details of the optional fields.

5. After submission, how long does it take to receive a DOI?

Once a successful metadata record is submitted, a DOI will be assigned and registered within 24 hours.

6. How do you designate time stamping or versioning of data objects?

When a major version change or update occurs to a data object, OSTI recommends a new DOI be registered. It is helpful to include a version number or time stamp as a part of the data object's title. This will allow data users and third party indexers (i.e. Google Dataset Search) to correctly index and cite the data object.

We recommend using the Related Identifier metadata field to reference previous versions, as well as express other relationships to a related source (including journal articles associated with the data object, data sets, figures, software, etc).

7. Do I have to make my data public to get a DOI?

No, the data does not need to be accessible to the public. But, a publicly available landing page providing metadata about the data objects and describing the data availability is required.

8. Is there a limit on number of DOIs that can be requested?

As part of the free service DOE OSTI provides to DOE-funded data objects, an unlimited amount of DOIs can be obtained.

9. Can the DOI link directly to the data?

No, DOIs should link to a landing page, which is a webpage that provides additional information describing the data, including a full bibliographic citation metadata, the DOI, title, abstract, submission/creation date, keywords, authors, and funding information. On the landing page, a link to the data should be provided.

If the data becomes deprecated, a landing page is important because a tombstone landing page can state why the data is no longer available.

10. Can a data object with an assigned DOI or metadata describing the data object be updated?

Yes, a DOI is persistent, but the data object itself and the metadata describing the data object may be updated at any time. The only metadata field that cannot be updated is the infix, which is a part of the DOI. Once assigned, the DOI number itself cannot be updated.

11. Can a DOI be deleted (error, duplicate)?

A DOI is persistent. Once registered and made public with DataCite, it cannot be deleted. If no other alternatives are viable, OSTI can “hide” a DOI so it will not appear in OSTI search tools and DataCite’s search. Although this is an option, it is seldom necessary. However, if you or someone else knows the exact DOI, it will resolve to the landing page.

12. If a data object is no longer available, what should I do?

When a data object is no longer available for whatever reason, a “tombstone” page needs to be created with information on why the dataset is no longer available. This provides the required persistence of a DOI.

13. How do I use the related identifier metadata field?

Related identifiers are a way to connect data objects with other research objects (journal articles, technical reports, datasets, instruments, experiments, awards, etc). OSTI currently has 31 different Relation Types (Describes/IsDescribedBy, HasVersion/IsVersionOf, etc.).

Related Identifier Fields:

Field Name	Description
relidentifier_detail	Tag encapsulating a single related identifier value.

related_identifier	The DOI of the related resource.
relation_type	A code specifying the type of relation between this identifier and the parent dataset.
related_identifier_type	The type of identifier, usually "DOI".

Example:

```

<relidentifiersblock>
<relidentifier_detail>
  <related_identifier>10.5072/238923</related_identifier>
  <relation_type>Cites</relation_type>
  <related_identifier_type>DOI</related_identifier_type>
</relidentifier_detail>
<relidentifier_detail relationType="References"
relatedIdentifierType="DOI">
  <related_identifier>10.5072/science/2019/18-200</related_identifier>
</relidentifier_detail>
</relidentifiersblock>

```

Please refer to the DOE Data ID Services Manual for more information.

14. Does OSTI provide a data repository to store my data indefinitely?

No, OSTI does not currently provide data repository services. OSTI hosts the metadata record for data objects that obtain a DOI, but OSTI does not provide a repository to store the actual data.

Typically, DOE Data ID Service data objects are hosted by the associated lab repository or the university's institutional repository.

15. Why would I want to reserve a DOI?

Reserved DOIs give the researcher the ability to obtain a DOI before a dataset is final or before publication. Reserved DOIs are placeholders within the OSTI E-Link ingest system but are not yet registered at DataCite.

Once a dataset is finalized/published, use your DOI or OSTI ID to update the metadata appropriately without the reserved XML tag. This will trigger the DOI to be released to DataCite for registration.

16. How can I reserve a DOI?

A DOI can be reserved through the Web Submission Interface and the API.

Web Submission Interface: Enter information for all required metadata fields (use placeholder information for what is not yet known), and then click the Save button. This will generate an OSTI ID, which can be used to predict what the DOI will be. For example, if my site's prefix is 10.0001, and my OSTI ID is 111111, then my DOI can be predicted to be: 10.0001/111111.

Once you are ready to submit your record and obtain your DOI, find the OSTI ID for the Saved record, click the Edit button, and then finish the record with the correct metadata and click Submit to OSTI.

API: Post all required metadata fields (use placeholder information for what is not yet known) and add the metadata field `</set_reserved>` to the API submission.

Once you are ready to submit your finalized record and make your DOI public, use the OSTI ID and resubmit the API request with the correct metadata and removing the `set_reserved` field from the submission.

17. Can I reserve a DOI if I do not yet have/know all of the required metadata?

Yes, you can enter "placeholder" information until accurate information is available.

18. What best practices exist (if any) in terms of the format, structure, and/or style to use for dataset citations?

DataCite provides a recommended data citation format for authors to use:

Creator (PublicationYear). Title. Publisher. Identifier

It may also be desirable to include information about two optional properties, Version and ResourceType (as appropriate). If so, the recommended form is as follows:

Creator (PublicationYear). Title. Version. Publisher. ResourceType. Identifier

For citation formatting based on a specific journal or publisher, see the [DOI Citation Formatter](#). Select a professional society, a scientific journal

publisher, etc. and see exactly how that group formats a citation and what to include in it.

FORCE11 has a [Joint Declaration of Data Citation Principles](#) that provide data citation best practices.

19. Where are my data objects discoverable?

OSTI provides discovery tools where data objects that have obtained DOIs can be discovered. [OSTI.GOV](#) is the primary search tool for DOE-funded research results including data. [DOE Data Explorer \(DDE\)](#) is the search tool for finding DOE-funded scientific data objects. OSTI also works closely with common search engines such as Google, Bing, Google Scholar, and Google Dataset Search to make sure our content is well indexed and discoverable.

20. How would I get a DOI for other STI, such as software or technical reports?

DOE OSTI offers a separate service for submitting software and obtaining DOIs through our software services platform and search tool, [DOE CODE](#). More information about how to submit software and obtain a DOI can be found [here](#).

All technical reports submitted to OSTI automatically receive a DOI upon successful submission. The DOI links directly to the technical report on OSTI.GOV.

21. What if I have additional questions?

Please contact OSTI's Data Team at DOEDataID@osti.gov.

Appendix: Release Notes

April 30, 2022: E-Link Version 1.8.8

- Geolocation – Resolved a rare issue where the geolocation description was interpreting the values as non-valid “points” within a bounding box, which caused the record to fail release processing.
- ORCID – ORCID iDs are now being properly submitted to DataCite in the correct XML format to ensure the ORCID iDs are correctly passed on to DataCite Commons.
- [E-Link 241.6 API Documentation](#) – Added a new column that shows the type of field it is (e.g., alphanumeric character and character limit, tag, object, etc.).

November 21, 2020: E-Link Version 1.8.3

- Data Collections – Removed data Collection as a product type. OSTI recommends using related identifiers to show collection relationships or link related data objects going forward.
- Award DOIs – Added the option to include Award DOIs and Funder Name to dataset records via the API and Web Submission Interface.

September 1, 2020

- DSpace-to-OSTI Dataset API Python module added to GitHub at <https://github.com/doecode/dspace> to help with API submissions by translating DSpace Python metadata into OSTI's required XML metadata fields.

August 8, 2020: E-Link Version 1.8.0

- API Documentation – Updated language for the <orcid_id> (ORCID) description to avoid syntax confusion and specify to only use the 16-digit number

August 4, 2020

- DOE Data ID Service Manual version 7.1 added to the [Data Services](#) webpage.

July 17, 2020

- OSTI API Python module added to GitHub at <https://github.com/doecode/ostiapi> to help with API submissions by translating Python into OSTI's required XML metadata fields.

April 6, 2020

- 2019 Data ID Workshop Report added to the Data Workshops webpage at https://www.osti.gov/dataexplorer/data_workshops_2019, which summarizes the workshop and the outcomes and lessons learned.

March 27, 2020

- DOE Data ID Service Manual version 7.0 added to the Data Services webpage at <https://www.osti.gov/data-services>. This is a complete redesign of the manual based on feedback from the 2019 Data ID Service Workshop, with a particular focus on education and examples.

December 7, 2019: E-Link Version 1.7.8

- Added logic in the 241.6 API to allow updates by accession number if the record already exists in the OSTI system. Records can now be updated with an <osti_id>, <doi>, or <accession_num>.
- Updated the [241.6 Instructions and Documentation](#) within E-Link to reflect the most recent changes.
- Added 2 new related identifier <relation_type> ("IsObsoletedBy" and "Obsoletes") terms based on DataCite's v4.2 schema update.
- Updated hyperlinks and text on E-Link's [About Data ID Service](#) page to reflect the latest information.

September 21, 2019: E-Link Version 1.7.7

- Updated to DataCite Metadata Schema 4.3 used for dataset submissions. Please see <https://schema.datacite.org/> for more information.
- Updated how E-Link handles 241.6 submitted records with existing, non-OSTI provided DOIs to prevent the records from erroring and not releasing.

August 3, 2019: E-Link Version 1.7.6

- Web Submission Interface – Added the ability to search and filter by Dataset Type to the Advanced Search page in E-Link.
- Updated Collection records to not require landing page URLs when submitted. If the user does not add a URL, the DOE Data Explorer metadata record webpage will automatically be used as the landing page.

- Updated E-Link release processing to skip the DataCite metadata registration and updates step if the DOI prefix associated with the submitted DOI does not belong to OSTI.

June 8, 2019: E-Link Version 1.7.5

- Data Collections
 - Removed automatic field mashup as the default functionality for Collections.
 - Added functionality to data Collections for a submitter to indicate “primary” author(s).
 - Added the functionality to remove <collection_items> tag group in favor of exclusively using the related identifiers field for association, including the “Compiles/IsCompiledBy” type for parent/child associations.
 - Updated and improved API functionality by adding a group of <add> and <remove> sets to perform set operations instead of the current “send all metadata” functions currently utilized (where a complete XML record must be sent to make any edit to existing Collection record).
 - Removed the requirement that all Collection items must exist in E-Link and must be in a “released” state.
- Web Submission Interface – Updated the summary page after the user completes submission to include the proposed DOI for reference, which will be registered with DataCite after release processing.
- Web Submission Interface – Resolved hover-over Help messages that did not display correctly.
- 241.6 Submissions – Updated the DataCite registration process to provide more information regarding failure cases so it is more apparent to the user what is wrong and how to fix the issue.
- 241.6 Submissions – Updated the test prefix used in Test E-link for dataset DOIs.
- 241.6 Submissions – Removed DOI link checking to improve the speed and efficiency of dataset submissions and DOI registration.

January 26, 2019: E-Link Version 1.7.4

- API – Improved handling of the <creators> field and <creatorsblock> when sending through edits using the 241.6 API, allowing the use of <add> or <remove> of individual creators. Added <author> and <authors> as synonyms.

- API – The 241.6 API submission was updated to require the site code tag to be sent with the submission in order to ensure the submissions are labeled with the correct site code when a user is affiliated with multiple site codes (such as two data repositories that submit separately to E-Link).
- API – Updated how E-Link handles responses from DataCite for records with DOIs that are not managed by DataCite. Previously, the error prevented the updated record from completing release processing, but now they will complete successfully.

November 3, 2018: E-Link Version 1.7.3

- Date Parsing – Improved how E-Link handles date variations (for example, E-Link now accepts YYYY-MM-DD in addition to YYYY/MM/DD).
- API – Updated the API's error handling to prevent the creation of OSTI IDs if no creator is submitted.
- API – Updated how Collection records process Authors to prevent duplicate Authors from being added to the same record. This is important because Collection records combine the author fields of all dataset records associated with it.
- API and Web Submission Interface – Added two new Data Types to the data type field: "Award" and "Instrument".

June 4, 2018: E-Link Version 1.7.1

- Updated the Web Submission Interface and API to replace the older "Contributor Organization(s)" field with an updated name of <collaboration_names>.

March 24, 2018: E-Link Version 1.6.8

- Removed Software as a valid dataset type option for new 241.6 records. Software is not needed as a dataset type, as all software should be submitted to DOE CODE.

November 16, 2017: E-Link Version 1.6.7

- API – Updated how the API handles submissions with the <title> tag and set the correct workflow status to prevent a record from being submitted without a title.

August 1, 2017: E-Link Version 1.6.4

- API – Added the <site_input_code> tag to both POST and GET so that the user can specify which site code to use and also to know what site code the records belong to.
- Collections – Updated the API to support an additional product type of Collection.

- Collections – If a product type is "Collection," the Edit and Enhance buttons are now hidden for that record.

April 22, 2017: E-Link Version 1.6.1

- Geolocation – Added Edit functionality so that geolocation can be updated.

March 29, 2017: E-Link Version 1.6.0

- Geolocation – Added a new metadata field to save Geolocation information to the Web Submission Interface and API.