

# Interagency **DOI Service**

Registering U.S. Federal Agency Research Outputs

Manual Version 1.0, June 2023

# Contents

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About the Interagency DOI (IAD) Service .....	3
What is IAD? .....	3
IAD Service Features.....	3
General Requirements.....	4
Agreement Process.....	4
Contacts.....	4
DOI Basics and Best Practices .....	5
The Digital Object Identifier (DOI).....	5
Why get DOIs? .....	5
The Landing Page.....	6
Preservation and Persistence .....	6
Submitting to IAD .....	7
The Application Programming Interface (API).....	7
Establishing Test Credentials .....	7
Confirming Test Credentials – New Client/Submitter .....	7
Moving from Test Environment to Production .....	7
Submitting Records to the API.....	7
Confirming Successful Record Submission .....	8
Handling Submission Errors.....	8
The User Interface (UI) .....	9
Creating an Infix.....	9
Reserving a DOI .....	10
To reserve a DOI in the IAD UI Submission Tool:.....	10
To reserve a DOI within the API: .....	11
Adding Related Identifiers with DOI Metadata .....	11
Editing DOI Metadata .....	12
To edit the metadata in the IAD UI Submission Interface:.....	12
To edit the metadata via the API:.....	12
Searching for a DOI.....	12
To search for a DOI in the IAD UI Submission Tool: .....	13
To search for a DOI in the IAD API:.....	13
Deleting a DOI and/or Associated Metadata.....	13

Appendices .....	14
IAD Metadata .....	14
DataCite Relation Types .....	16
Example JSON Record.....	20
Example XML Record.....	21

## About the Interagency DOI (IAD) Service

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### What is IAD?

The [Interagency DOI \(IAD\) Service](#) is provided by DOE OSTI to other US government agencies who would like to assign DOIs to their research outputs. OSTI registers the DOIs with [DataCite](#) to aid in citation, discovery, retrieval, and reuse. OSTI assigns and registers DOIs for IAD Service clients on a cost-reimbursable basis.

OSTI became a member of DataCite in 2010 to facilitate citing, accessing, and reusing publicly available scientific research datasets produced by DOE-funded researchers. DataCite is an international not-for-profit organization that supports data visibility, ease of data citation in scholarly publications, data preservation and future re-use, and data access and retrievability. DataCite provides DOI services as a registration agency of the [International DOI Foundation](#).

### IAD Service Features

The IAD Service features include:

- Administrative support to become an IAD organization, set up the IAD Service through an interagency agreement (IAA), and join the DOE OSTI-hosted DataCite Consortium.
- Administrative support throughout the organization's use of the IAD Service.
- Technical support while using the service and specifically when using the DOE OSTI-provided application programming interface (API) and/or user interface (UI) to submit the metadata needed for DOI assignment.
- Continuous updates and maintenance of the DOE OSTI API and UI.
- Membership in our data community of practice and participation in the monthly Data ID Service community calls. Community calls provide a forum for IAD organizations and the larger data DOI community to get updates from DOE OSTI on the service and to share best practices, other use cases, and challenges with other members of the community.
- Quality control checks such as link checking and failure notifications.

The IAD Service offers two options to submit metadata for DOI assignment:

#### 1. **User Interface (UI) Submission Tool – Single metadata record submission**

DOE OSTI provides a UI Submission Tool. This tool is a good option when planning to assign a low number of DOIs. Through the UI, IAD organizations can provide metadata for a new IAD record for DOI assignment or update the metadata associated with an existing DOI.

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

The IAD API allows users to register DOIs (through a POST function) as well as query various previous submissions for status of the process (through a GET function). IAD organizations who wish to use the API need to develop an API endpoint within their system to submit/send metadata to the IAD API.

## General Requirements

General requirements have been established for DOI registration. The IAD organizations must:

- Provide the required metadata to enable basic, bibliographic citation.
- Have the authority to host a public landing page for the DOI to resolve to.
- Guarantee the persistence of registered data and DOI landing page through established data management practices.
- Maintain and update DOI metadata and landing pages/URLs.

## Agreement Process

The IAD Service is provided by OSTI to other federal agencies on a cost-recovery basis. To begin assigning and registering DOIs using the IAD Service and to become a consortium organization under the DOE OSTI DataCite Consortium, an Interagency Agreement (IAA) using the G-Invoicing system (using the GT&C and Order forms) must first be created and be approved by both OSTI and the other U.S. federal agency. For more info on process and fees, see the [IAD Operating Parameters](#). Once the IAA is completed and fees are paid, the agency is part of the DOE OSTI DataCite Consortium and may start submitting metadata records for DOI assignment and registration.

## Contacts

[IAD@osti.gov](mailto:IAD@osti.gov) – First point of contact for technical and administrative questions

- M-F 8 am – 4 pm ET

Sara Studwell – IAD Liaison

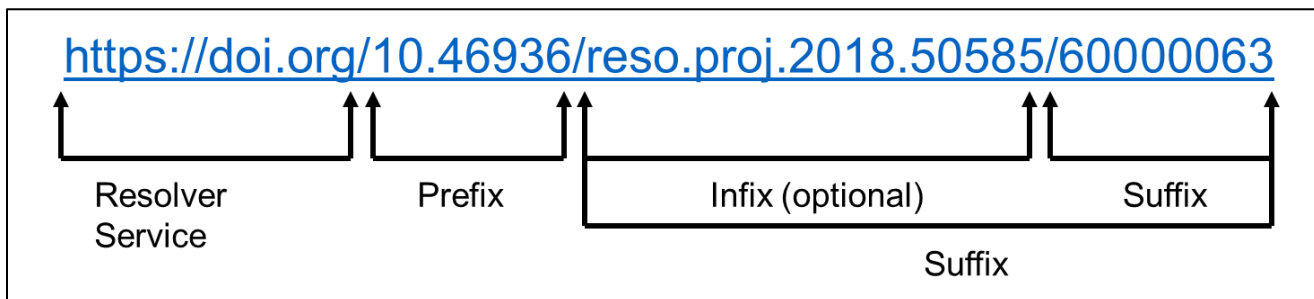
- [studwells@osti.gov](mailto:studwells@osti.gov)
- 865-241-5275

# DOI Basics and Best Practices

## The Digital Object Identifier (DOI)

A DataCite DOI consists of a prefix, infix, and suffix. Each IAD organization initially receives a numeric prefix from DataCite, which is specific to that organization. There are some cases when an organization may want multiple prefixes (multiple repositories, distinguish different projects, etc.), and OSTI can work with DataCite to obtain the additional prefix(es).

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



The **Infix** is optional and can be incorporated by the IAD organization/submitter. The infix can add intelligence to the DOI by incorporating project, organization, 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 ID. Every metadata record processed through OSTI's IAD Service receives an 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.

The DOI is resolved by entering a DOI at: <https://dx.doi.org/>:

### Resolve a DOI Name

doi:

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.

## Why get DOIs?

- DOIs enable greater discovery through indexing in common search engines and research discovery platforms.
- DOIs facilitate linkages to other persistent identifiers and associated research outputs such as publications, datasets, software, and reports.
- DOIs are designed to be more stable and persistent links than normal URLs, which can break or be unreliable. Registering the DOI with a registering agency, such as DataCite, provides global resolution and the prospect of increasing visibility of research components.
- DOIs provide a mechanism for research components to be referenced in a standardized format.
- While information about the research component may change or be updated over time, the DOI itself is persistent.

## The Landing Page

A DOI points/resolves to a landing page or URL, which provides information about/metadata describing the object, including how to access it. A landing page should contain the following information:

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

Below is an example of a landing page:

The screenshot shows the PANGAEA landing page for a dataset. The page header includes the PANGAEA logo and the text "Data Publisher for Earth & Environmental Science". The main content area displays the full bibliographic citation: "Hüning, Anne K; Melzner, Frank; Thomsen, Jörn; Gutowska, Magdalena A; Krämer, Lars; Kohno, Mika; Rosenstiel, Philip; Pörtner, Hans-Otto; Philipp, Eva E R; Lucassen, Magnus (2013): Seawater carbonate chemistry and mantle gene expression patterns of the Baltic Sea blue mussel in a laboratory experiment. PANGAEA, <https://doi.org/10.1594/PANGAEA.833670>". Below the citation, there are links for "Download Data", "Download dataset as tab-delimited text", and "View dataset as HTML".

Annotations on the left side of the screenshot:

- Full bibliographic citation**: Points to the full citation text.
- DOI displayed as URL**: Points to the DOI link in the citation.
- Access to the item**: Points to the "Download Data" and "Download dataset as tab-delimited text" links.

Annotations on the right side of the screenshot:

- DOI tagged in page meta (DC.identifier in this case)**: Points to the DC.identifier meta-tag in the page metadata.

The page metadata (DC:identifier) is shown in the console on the right:

```
<meta name="DC.identifier" content="https://doi.org/10.1594/PANGAEA.833670" scheme="DCTERMS.URI"/>
```

## Preservation and Persistence

- Consideration should be made for long-term preservation of and access to the research object – e.g. manage and update metadata (including landing pages/URLs as needed for the DOI to properly take the user to the correct page).
- A DOI is meant to be persistent, meaning it should exist in perpetuity and will always be attached to each distinct research object and associated metadata.
- Because a DOI is persistent, it cannot be completely deleted, and the DOI will still resolve to the landing page.
- If a research object (with associated DOI) must be made inaccessible (for security concerns, PII, etc.), the landing page needs to be updated or replaced to indicate the object is no longer accessible. This is called a tombstone page. See Deleting a DOI for more information about tombstone pages.

# Submitting to IAD

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There are two options for submitting metadata for DOI assignment through IAD – the IAD API, and the IAD User Interface (UI).

1. IAD API: <https://www.osti.gov/iad2/api/records>
2. IAD UI: <https://www.osti.gov/iad2/>

## The Application Programming Interface (API)

The IAD API allows users to register DOIs (through a POST function) and query various previous submissions for status of the process (through a GET function). IAD organizations who wish to use the API need to develop an API endpoint within their system to submit/send metadata to the DOE OSTI API.

## Establishing Test Credentials

To use the production API, users must first submit through the Test IAD system before being able to submit in production. In the Test IAD system, users can freely practice submissions without worrying about registering a live DOI. The IAD Services Manager will work with the user on checking submissions for errors and providing best practice recommendations. Once the user has enough experience and a high success rate of submissions, they will be given production API credentials. Before using the Test IAD system, users must obtain the following by contacting [IAD@osti.gov](mailto:IAD@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 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 by the IAD DOI Service will begin with this prefix.
3. IAD Account – Finally, OSTI establishes a Test IAD account. The IAD API requires the user to include the credentials in the header of the server's transmission file.

## Confirming Test Credentials – New Client/Submitter

To confirm that the Test credentials are working:

1. Go to the Test IAD system: <https://www.osti.gov/iad2test/api/records>
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 JSON. If so, the user has successfully logged into the Test IAD account.

## Moving from Test Environment to Production

Upon successful testing, the user can move into production IAD, where all metadata record submissions are assigned a DOI. Please contact [IAD@osti.gov](mailto:IAD@osti.gov) to start the transition to production.

- Production API Documentation: <https://www.osti.gov/iad2/docs>
- Production API: <https://www.osti.gov/iad2/api/records>

## Submitting Records to the API

Records may be formatted in either JSON or XML for submission to IAD. Each submission should include the required record fields, noted below. Multiple records may be submitted to IAD at once, and new submission records may be intermixed with

record updates as desired. Records may be submitted in JSON format as an array of objects, as defined by the Record Model; or if XML, as a collection of individual <record> entities within a <records> container.

For submissions, the following elements are required:

- Title
- Author(s)/Creator(s)
- A publication date
- A site URL (if NOT Reserving a DOI – see Reserving a DOI for more information)
- A product type
- A specific product type for non-dataset items

## Confirming Successful Record Submission

Each submission response will contain a status value, which should be either Pending for accepted records, or Error for those with issues. Any errors on individual records will be noted in the "errors" JSON array or <errors> XML collection as appropriate to the response format chosen.

When a metadata record has been submitted, the IAD organization POCs will receive an email detailing whether submission was successful or unsuccessful. If unsuccessful, details will be given on why it failed. Please contact [IAD@osti.gov](mailto:IAD@osti.gov) to help with resolution of any submission issues. An example email of a successfully submitted record will look like this:

Date 02/15/2022

Submitted 1 records.

There were 0 errors.

#	ID	Title	DOI	Status
1	1524240	Dissociable oscillatory theta signatures of memory	10.15154/1524240	Pending

**Note:** A new record successfully added to IAD is put in PENDING status and will be submitted to DataCite for DOI assignment overnight. If the DOI fails to be registered at DataCite, it will remain suspended in a PENDING status in IAD until the problem is corrected. Users will receive a "DOI registration error" email notification if that occurs.

## Handling Submission Errors

Submission errors return specific information to the user when a record fail to validate. Submission errors usually will respond with 200-OK but will detail in the body of each record response the condition and error messages. The response for each record will contain a status tag or attribute; any of these in "Error" state should also contain either an "errors" array (JSON) or <errors> container (XML) containing information about the errors.

**Note:** These submission errors are distinct from existing records in "Error" status; such records indicate the metadata itself is valid, but an issue occurred with DOI registration. Reasons for this are detailed in the "doi\_message" field of the records, which can be returned via [performing a GET request](#) for the status of Error.



## The User Interface (UI)

DOE OSTI provides a UI upload request tool. This tool is a good option when planning to assign a low number of DOIs. Through the UI, IAD organizations can upload a metadata file/record that will be used to register that DOI or update the metadata associated with an existing DOI.

Users should elect “Upload Request” from the IAD homepage (<https://www.osti.gov/iad2/>), select the file to send, and click “Transmit Request”.

The user will be prompted to sign in using their IAD account credentials. Once provided the user will receive either a success message with the record(s) DOI(s), or an error message detailing the specific error. A list of common error codes can be found in the [IAD API Documentation](#).

### Upload IAD Content

This form facilitates the transmission of IAD new record or update requests with the system through the use of an interactive form.

#	Title	Status/DOI
1	Dissociable oscillatory theta signatures of memory formation in the developing brain	10.81002/30609

Total of 1 record(s), 0 error(s).

Select file to send

Browse... submission\_004852.json

Transmit Request

The user also has the ability to view all their submissions to IAD by selecting the “My Records” option on the homepage. Here, the user has the ability to search, filter results, and export records (TXT, CSV, Excel).

ID	Title	DOI	Status
20056	Nunc purus. Phasellus in felis.	10.80282/20056	Registered
20066	Quisque erat eros, viverra eget, congue eget, semper rutrum, nulla. Nunc purus. Phasellus in felis.	10.80282/20066	Registered
20061	Prasent blandit lacinia erat. Vestibulum sed magna at nunc commodo placerat. Praesent blandit. Nam nulla. Integer pede justo, lacinia eget, tincidunt eget, tempus vel, pede. Morbi porttitor lorem id ligula. Suspendisse ornare consequat lectus. In est risus, auctor sed, tristique in, tempus sit amet, sem.	10.80282/20061	Registered
20063	Cras mi pede, malesuada in, imperdiet et, commodo vulputate, justo. In blandit ultrices enim. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Proin interdum mauris non ligula pellentesque ultrices. Phasellus id sapien in sapien iaculis congue. Vivamus metus arcu, adipiscing molestie, hendrerit at, vulputate vitae, nisl. Aenean lectus. Pellentesque eget nunc. Donec quis orci eget orci vehicula condimentum.	10.80282/20063	Registered
20067	Nam congue, risus semper porta volutpat, quam pede lobortis ligula, sit amet eleifend pede libero quis orci. Nullam molestie nibh in lectus.	10.80282/20067	Registered
20047	In hac habitasse platea dictumst. Etiam faucibus cursus urna.	10.80282/20047	Registered
20048	Morbi quis tortor id nulla ultrices aliquet. Maecenas leo odio, condimentum id, luctus nec, molestie sed, justo. Pellentesque viverra pede ac diam.	10.80282/20048	Registered
20065	Nunc rhoncus dui vel sem. Sed sagittis. Nam congue, risus semper porta volutpat, quam pede lobortis ligula, sit amet eleifend pede libero quis orci. Nullam molestie nibh in lectus.	10.80282/20065	Registered
20055	Vivamus vel nulla eget eros elementum pellentesque. Quisque porta volutpat erat. Quisque erat eros, viverra eget, congue eget, semper rutrum, nulla. Nunc purus. Phasellus in felis.	10.80282/20055	Registered

Showing 41 to 50 of 193 rows 10 rows per page

## Creating an Infix

An infix is the optional string provided by the organization that created the research object that adds intelligence to the DOI by incorporating project, facility, or other specific information.

Example: <https://doi.org/10.5684/project-name/2837382>

To add an infix to a DOI, include the infix tag (“doi infix:” or </doi\_infix>) when submitting to the IAD API or in the file uploaded in the UI Submission Tool.

Example: “doi\_infix:”for-example-purposes”

## Reserving a DOI

It may be necessary to obtain a DOI prior to a research object's publication, or for other convenience purposes prior to its being publically available. In such cases, IAD provides the ability to get a DOI value without completing registration of the DOI with DataCite.

Reservations are obtained in the same manner as usual record submissions, but the status of "Reserved" is requested, and the "site\_url" value is NOT required. This will create a placeholder record in IAD's system and return a valid DOI value that will not yet resolve to its destination.

A DOI can be reserved through the either IAD UI Submission Interface or the API.

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

### To reserve a DOI in the IAD UI Submission Tool:

Select the JSON or XML file to submit through the interactive interface by using the "Browse" button. The JSON file will need to include the "status": "Reserved" field. Once you've selected the desired file, use the "Transmit Request" button to send the metadata record to OSTI.

This will generate an ID and the DOI that will eventually be registered at DataCite.

### Upload IAD Content

This form facilitates the transmission of IAD new record or update requests with the system through the use of an interactive form.

#	Title	Status/DOI
1	What next? A Bayesian Hierarchical Modeling Re-Examination of Treatments for Adolescents with Selective Serotonin Reuptake Inhibitor-Resistant Depression	10.81002/30193

Total of 1 record(s), 0 error(s).

#### Select file to send

Browse...

submission\_140629.json

Transmit Request

The ID of a submission can be determined by the DOI suffix. Once a record is uploaded the user will receive the information found above. The "Status/DOI" column contains the DOI for the record, and the suffix of the DOI is the ID for that record. For example, if the DOI for the record is **10.00001/42356**, the ID will be **42356**.

Once the user is ready to submit the record and obtain a DataCite registered DOI which is indexed and publicly searchable, they will repeat the same upload procedure with either a file that contains ONLY the ID (if the original file submission contained the URL for the research object), or a file with the ID and the URL that will resolve to the research object.

Finally, finish the record by selecting "Transmit Request" again. This will send the record metadata to DataCite and register the DOI. The user will receive an email confirming a successful submission (if there are no errors) with a PENDING status. The reserved DOI will be registered and resolvable usually within a few minutes of making the request.

## 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 "status": "Reserved" to the API submission.

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

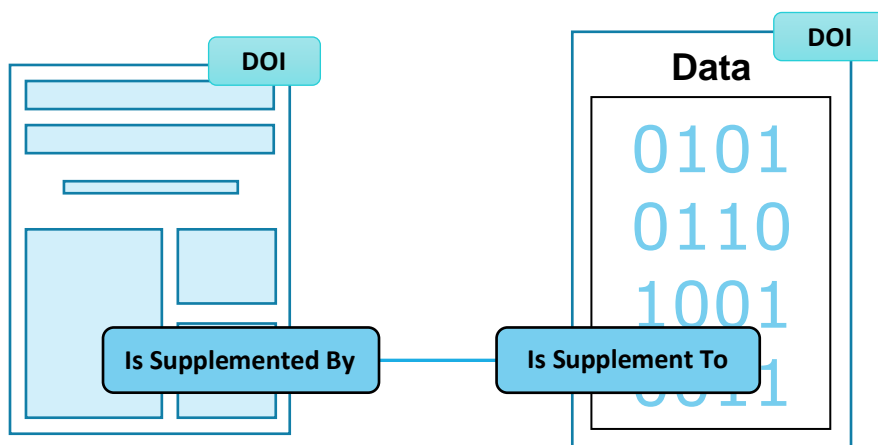
```
{
  "records": [{
    "id": 251899,
    "site_code": "SITECODE",
    "title": "Unpublished Data Set #001",
    "doi": "10.5072/251899",
    "authors": [{
      "first_name": "Guy",
      "last_name": "Sample",
      "affiliations": []
    }],
    "contributors": [],
    "status": "Reserved",
    "publication_date": "2018-12-15",
    "product_type": "Dataset",
    "related_identifiers": [],
    "date_record_added": "2017-11-30",
    "date_record_updated": "2017-11-30",
    "index": 1
  }],
}
```

Once the user is ready to submit the record and obtain a DataCite registered DOI (which is indexed and publicly searchable), an additional update request should be made, removing "status": "Reserved" and providing the site\_url value in order to notify IAD that the DOI is ready to be assigned.

Note that if successful, this will place the record in a Pending state, and the reserved DOI will be registered and resolvable usually within a few minutes of making the request.

## Adding Related Identifiers with DOI Metadata

Related identifiers are a way to link research objects with each other (e.g., journal articles, technical reports, datasets, instruments, experiments, awards, etc.) to give users a fuller picture of how research objects are connected. This can help to facilitate the validation of research results and support research reproducibility. DataCite's Metadata Schema supports the use of related identifiers to connect related research objects. Examples include DOIs, IGSNs, ARKs, URLs. A full list of accepted identifier types can be found in the [IAD API Documentation: Identifier Types](#).



*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 research objects, as well as express other relationships to a related source. Please see the DataCite Relation Types section of the appendix for the full list of relation types and their definitions.

## 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 IAD UI Submission Interface or the API. Through both, the changes should appear on the metadata at DataCite within a few minutes, so long as there are no errors.

### To edit the metadata in the IAD UI Submission Interface:

Users should log into IAD with their login credentials to edit records. After logging into IAD, click on Upload Request. Whenever editing through the UI Submission Interface, it is not required to resubmit all metadata for the record. All that is needed is the ID or Accession Number, and the fields that need to be changed. Select the JSON or XML file that contains the ID or Accession Number and the metadata field(s) being edited and click Transmit Request.

The edited record will be sent to DataCite and the updated metadata will be visible within a few minutes.

### 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 ID or Accession Number, and the JSON or XML fields that need to be changed.

Example: `[{"id":251599, "title":"Updated Title" }]`

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

The edited record will be sent to DataCite and the updated metadata will be visible within a few minutes.

## Searching for a DOI

After the user has submitted the metadata record to IAD via the API or the UI Submission Interface and the DOI has been registered by DataCite, the metadata record and DOI will be visible in DataCite Commons and indexed in commercial search engines like Google and Bing.

## To search for a DOI in the IAD UI Submission Tool:

The user can search for a record/list of records in the IAD UI Submission Tool by selecting the “My Records” option on the homepage when logged in. This will provide a list of all records submitted to IAD. Here the user has the ability to search, filter results, and export records (TXT, CSV, Excel).

## To search for a DOI in the IAD API:

Through the IAD API you can also search for a DOI using the GET function.

For example, GET - <https://test.osti.gov/iad2/api/records?id=#####>

Please refer to the [IAD API Documentation: Getting Records from IAD](#) for more information on use cases and a list of searchable fields.

## Deleting a DOI and/or Associated Metadata

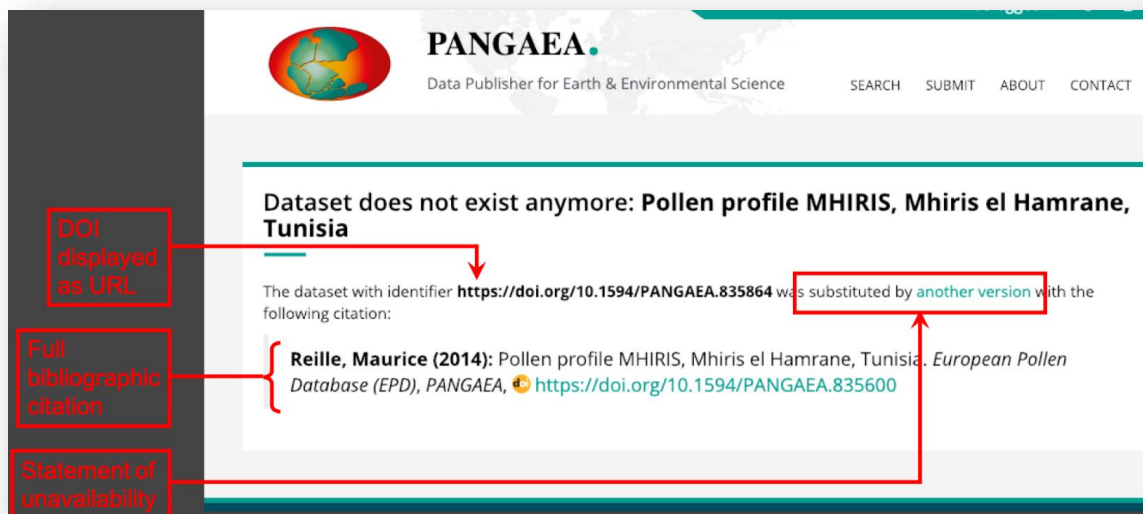
A DOI cannot be deleted, as it is a persistent identifier. If the exact DOI is searched in a browser or resolved, it will still point to the landing page. However, OSTI can “hide” the DOI and associated metadata record in DataCite Commons.

If the user wishes to hide a research object (that has a DOI), please contact OSTI at [IAD@osti.gov](mailto:IAD@osti.gov) and specify the ID, DOI, and the reason for hiding the object. OSTI will work with you to find a solution to retain the DOI. If this is not feasible, OSTI will work with DataCite to remove the metadata associated with DOI.

When “hiding” a DOI, the landing page needs to be updated or replaced to indicate the research object is no longer accessible. This required webpage is called a tombstone page. The tombstone page should include:

- A full bibliographic citation (so users can verify they have found the correct item/landed on the correct page).
- The DOI itself in both a human-readable and machine-readable format
- A statement of unavailability describing why the object is no longer available. It should be clear to users that the item being described is in fact associated with the DOI they resolve to, but that item is now no longer available.

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



# Appendices

## IAD Metadata

Mapping of OSTI's collected metadata in IAD API to the DataCite Metadata Schema (v.4.4). Required/Optional fields are as designated in IAD.

OSTI-collected metadata not sent to DataCite indicated where applicable.

Legend
Array Field (field with subfields)
Subfield
Not sent to DataCite

IAD API Metadata Field	Required (R), Optional (O)	DataCite Metadata Property (v.4.4)	Notes
id	O	alternateIdentifier	alternateIdentifierType="IAD ID"
accession_num	O	alternateIdentifier	alternateIdentifierType="Site ID"
title	R	title	
<b>Author(s) [Array]</b>	<b>O</b>	<b>creator [element]</b>	
first_name	R	givenName	
middle_name	O	Not sent to DataCite	
last_name	R	familyName	
affiliations	O	affiliation	
email	O	Not sent to DataCite	
orcid_id	O	nameIdentifier	nameIdentifierScheme="ORCID"
publisher	R	publisher	
report_numbers	O	alternateIdentifier	alternateIdentifierType="Report Numbers"
contract_numbers	O	alternateIdentifier	alternateIdentifierType="Contract Numbers"
product_type	R	resourceTypeGeneral	
product_type_specific	O	resourceType	
research_organization	O	Not sent to DataCite	
publication_date	R	publicationYear	
language	O	language	
country	O	Not sent to DataCite	
sponsor_org	O	Not sent to DataCite	
availability	O	Not sent to DataCite	

IAD API Metadata Field	Required (R), Optional (O)	DataCite Metadata Property (v.4.4)	Notes
site_url	R	identifier	
site_code	R	Not sent to DataCite	Internal OSTI identifier.
<b>Contributor(s) [Array]</b>	<b>O</b>	<b>contributor [element]</b>	
first_name	R	givenName	
last_name	R	familyName	
affiliations	O	affiliation	
contributorType	R	contributorType	
email	O	Not sent to DataCite	
orcid_id	O	nameIdentifier	nameIdentifierScheme="ORCID"
<b>Contributing_organization(s) [Array]</b>	<b>O</b>	<b>contributor [element]</b>	
full_name	R	contributorName	
orcid_id	O	nameIdentifier	nameIdentifierScheme="ORCID"
affiliations	O	affiliation	
contributorType	R	contributorType	
email	O	Not sent to DataCite	
other_numbers	O	alternateIdentifier	alternateIdentifierType="Other Numbers"
keywords	O	subject	
description	O	description	descriptionType="Abstract"
doi	R	identifier	identifierType="DOI"
doi_infix	O	identifier	
set_reserved	O	Not sent to DataCite	
<b>Related Identifiers(s) [Array]</b>	<b>O</b>	<b>relatedIdentifier [element]</b>	
related_identifier_type	R	relatedIdentifierType	
identifier_value	R	relatedIdentifier	
relation_type	R	relationType	

## DataCite Relation Types

Relation	Description
Cites	<p>indicates that A includes B in a citation</p> <p>OSTI Guidance: Use this relationship to show what the dataset is citing.</p>
IsCitedBy	<p>indicates that B includes A in a citation</p> <p>OSTI Guidance: Use this relationship to show the research objects which are citing the dataset (such as a journal article, technical report, etc.).</p>
Compiles	<p>indicates B is the result of a compile or creation event using A (used in COLLECTIONS to indicate collection item)</p> <p>OSTI Guidance: Use this relationship to indicate a collection item if it is part of a Collection, or to indicate software or text that compiles/creates B.</p>
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>
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>
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>
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>
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>



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>
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>
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>
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>
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>
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>
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>
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>
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>

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.</p>
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>
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>
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>
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>
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>
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>
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>
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>

---

IsReviewedBy

indicates that A is reviewed by B

OSTI Guidance: Use this relationship to show that this work is reviewed by another work, such as a book review or journal comment.

---

## Example JSON Record

```
{
  "accession_number": "EXAMPLE001",
  "availability": "Check with publisher website for document availability",
  "authors": [{
    "first_name": "Test",
    "last_name": "Guy",
    "email": "just.a.test@someplace.com"
  }],
  "contributors": [{
    "full_name": "Contributing Editors, Inc.",
    "contributor_type": "Editor"
  },
  {
    "first_name": "Researcher",
    "last_name": "Guy",
    "email": "research.associate@university.edu",
    "affiliations": ["Research Associates Corp."],
    "contributor_type": "Researcher"
  }
  ],
  "contract_numbers": "Example-001-2017",
  "country": "US",
  "description": "This is a document example containing all the relevant information fields for metadata.",
  "doi_infix": "my-example-infix",
  "keywords": "Sample Data",
  "language_code": "English",
  "other_numbers": "OtherIdentifyingNumbers",
  "product_type": "Dataset",
  "product_type_specific": "Short description of data specifics",
  "publication_date": "2017-12-02",
  "publisher": "ACME Examples, Inc., LLC",
  "report_numbers": "EX-001-2017",
  "research_organization": "Research Associates Corp.",
  "site_url": "http://my.data.site.com/example-dataset.pdf",
  "sponsoring_organization": "Data Collection Resources",
  "title": "This is a test example of a record",
  "related_identifiers": [{
    "identifier_type": "DOI",
    "identifier_value": "10.5072/9991/2017/238943",
    "relation_type": "Cites"
  }
  ]
}
```

## Example XML Record

```
<records>
  <record>
    <title>This is a test example of a record</title>
    <sponsoring_organization>Data Collection Resources</sponsoring_organization>
    <research_organization>Research Associates Corp.</research_organization>
    <accession_number>EXAMPLE001</accession_number>
    <doi_infix>my-example-infix</doi_infix>
    <report_numbers>EX-001-2017</report_numbers>
    <contract_numbers>Example-001-2017</contract_numbers>
    <other_numbers>OtherIdentifyingNumbers</other_numbers>
    <publisher>ACME Examples, Inc., LLC</publisher>
    <availability>Check with publisher website for document availability</availability>
    <publication_date>2017-12-02</publication_date>
    <country>US</country>
    <description>This is a document example containing all the relevant information fields for metadata.</description>
    <site_url>http://my.data.site.com/example-dataset.pdf</site_url>
    <product_type>Dataset</product_type>
    <product_type_specific>Short description of data specifics</product_type_specific>
    <date_record_added>2017-11-30</date_record_added>
    <date_record_updated>2017-11-30</date_record_updated>
    <keywords>Sample Data</keywords>
    <authors>
      <author>
        <email>just.a.test@someplace.com</email>
        <first_name>Test</first_name>
        <last_name>Guy</last_name>
        <affiliations/>
      </author>
    </authors>
    <contributors>
      <contributor>
        <full_name>Contributing Editors, Inc.</full_name>
        <contributor_type>Editor</contributor_type>
        <affiliations/>
      </contributor>
      <contributor>
        <email>research.associate@university.edu</email>
        <first_name>Researcher</first_name>
        <last_name>Guy</last_name>
        <contributor_type>Researcher</contributor_type>
        <affiliations>
          <affiliation>Research Associates Corp.</affiliation>
        </affiliations>
      </contributor>
    </contributors>
  </record>
</records>
```

```
<related_identifiers>
  <related_identifier>
    <identifier_type>DOI</identifier_type>
    <identifier_value>10.5072/9991/2017/238943</identifier_value>
    <relation_type>Cites</relation_type>
  </related_identifier>
</related_identifiers>
</record>
</records>
```