

Zotero Best Practices for LTER Sites

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Introduction

[Zotero](#) is a free reference manager that can help you organize a listing of conference presentations, journal articles, dissertations, and other works produced by your LTER site. These works are described in a database that is synced between your desktop and Zotero's servers in the cloud. The server supports an API enabling searching of the database, which means LTER websites can include an interactive bibliography search. Zotero can also export to BibTeX format, which is convenient since Research.gov accepts BibTeX for describing products produced by your award.

This document describes best practices for using Zotero for LTER sites, with a focus on supporting a network wide bibliography, reporting to Research.gov, and supporting a searchable bibliography on an LTER website.

This document has short URL: https://bit.ly/ZOTERO_BP.

Getting Started

- Create a Zotero account just for your LTER site.

This maximizes your free storage (so you're not sharing LTER stuff with other items in your personal account) and facilitates handling the account over to the next publication manager when you leave the project.

Be sure to download both the desktop client and the Zotero Connector for your Web browser. The desktop client syncs your local copy of your database to the cloud and lets you easily manage your database. The Connector can automatically harvest metadata for a given publication that you're looking at in your browser and add it to your database.

- When using Zotero Connector, you'll typically get the most metadata harvested if you go to the journal through which the article is published rather than sites like Google Scholar.

With a free account you get limited storage, so sharing PDF attachments of journal articles could become costly over time, requiring a paid storage plan; plus there are copyright considerations. However, you can tell Zotero not to sync attachments, enabling you to maintain a local copy of PDFs of articles while just supplying bibliographical information to the cloud.

- In the desktop client, set preferences so that attachments are not synced to the cloud.
- If a snapshot attachment was created automatically (e.g., when you read metadata from a website, it includes a snapshot of the page as an attachment), delete the attachment.

Consider creating a Zotero group. One advantage of using a cloud-based solution like Zotero is that multiple users can have access to your group and contribute their publications. In practice, this increases the likelihood of inconsistent item descriptions. Unless you've set up protocols on how to manage your site's Zotero group and trained your personnel accordingly, you may find it easier just to enter all items yourself. Note that some edits can only be performed with the desktop client, so if it doesn't work in your browser, try using the desktop application. Also, some edits like changing Item Type can only be performed by the Member who originally added the item Collection.

If you create a Zotero group for an LTER site, consider naming the group LTER-ABC, where ABC is the three-letter acronym for your. Currently, when users search for groups in Zotero, the search term is matched from the start of the group name, so a search for "LTER" would not show a result for a group named "ABC-LTER." Naming your group LTER-ABC enables users to discover your group if they are just looking for LTER sites in general. You can add a link to your website pointing to your Zotero LTER group for users who are familiar with your site and are trying to browse to your library directly. Don't forget to add a description for the group and also a website address pointing back to your LTER website.

- If you create a Zotero group for your LTER site, name it LTER-ABC, where ABC is your three letter acronym for your site, e.g., LTER-BLE.

If your team is using another reference manager and they need to send you items for Zotero, you can ask them to export a BibTeX file or use another supported format, and then you can import that file using the Zotero desktop application.

- Always include a DOI when available. This can help identify duplicates when LTER NCO builds a network-wide bibliography.
- For items that should be included in a network-wide bibliography, add a tag of LTER-ABC, where ABC is your three letter acronym for your site, e.g., LTER-BLE.
- Tag items that are focused on information management with LTER-IM. (IM stands for Information Management.)
- Organize your items (or not) into collections that support your end goal. See suggestion in the Research.gov section.

Sharing with the LTER Network Bibliography

The LTER Network bibliography includes key products from all NSF-funded LTER sites. The network bibliography is maintained in Zotero, which means Zotero users can share their items directly with the network instead of submitting a BibTeX file. To achieve this, we recommend inviting the [LTER Network user](#) (as of this writing, Marty Downs) to join your group by sending her an email with your group's URL and the name of the collection in your group which represents items to share with the network. The network user can then drag and drop items from your collection into the appropriate network collection. Be sure that items in your collection are tagged with LTER-ABC where ABC is the acronym for your site. This helps identify cross site papers.

- Maintain a collection called "For-Network" of [items suitable for sharing with the LTER Network group](#) (this may also be annual collections if you prefer to track items by year instead of relying on the date modified field).
- Add a tag, LTER-ABC, to each item in the collection. **Tip:** Once you've created a tag, you can apply it to all items in a collection by selecting the items and dragging them onto the tag as it appears in the bottom left corner of the Zotero desktop application.
- For the purposes of the 40 year review, do not include undergraduate theses.

Pro Tip: Use Colored Tags. You can right-click a tag amongst the tags in the bottom left corner of the Zotero desktop application and assign a color. The tag will also be assigned a number, e.g., 1. You can then select all items in a collection and press the number on your keyboard to assign that tag to all items. A dot with the same color as the tag will appear next to each item so that you can quickly identify the items with that tag.

Reporting Publications to Research.gov

Zotero can streamline reporting of journal articles that have yet to be published, juried conference papers, books, book sections, theses and dissertations, and non-peer-reviewed conference presentations when describing products on Research.gov for your NSF annual report. Note that published journal articles are deposited in a separate site, NSF-PAR, for proposals submitted after 2016-01-25.

Books, Theses, Other Conference Presentations

Instead of manually entering books, book sections, theses, dissertations, and non-peer-reviewed conference presentations in Research.gov, you can upload a BibTeX file that contains all of these items in bulk. The Zotero desktop application can create a BibTeX file from library, group, collection, or selection. Follow the table below to ensure that the desired information is translated correctly from Zotero to BibTeX to Research.gov. Bold fields are required; "year" is optional if not yet published. It's okay to have information in other Zotero fields but it won't be used by Research.gov.

For more information on what Research.gov accepts, visit the [Project Reports help page](#) and search for `Entry Type`.

Note that for proposals submitted after 2016-01-25, you upload peer-reviewed items along with attachments separately via NSF-PAR, and you enter unpublished peer reviewed items via a bibliographical entry as described later in this document.. If this is you, then do not include peer-reviewed items in your BibTeX export. Although the information is read correctly by Research.gov, a red X will appear next to the item and it will not be accepted. Still, the mapping for journal articles is described in the table below in case journal articles are accepted via BibTeX in the future.

Zot Type	Zot Field	Bib Type	Bib Field	Gov Type	Gov Field
Journal Article	Author Date Title Publication Volume Issue Pages DOI ISSN	article	author year title journal volume number pages doi issn	Journal or Juried Conference Paper	authors year title journal volume issue pages doi issn (if no DOI)
Book	Author Title Date Edition	book	author title year edition	Book	author title year edition

	Volume Editor Place Publisher ISBN		volume editor address publisher isbn		volume editor place publisher ISBN
Book Section	Title Author Book Title Date Edition Volume Editor Place Publisher Pages ISBN	incollection	title author booktitle year edition volume editor address publisher pages isbn	Book Chapters	chapter title author book title year edition volume editor place publisher pages ISBN
Thesis	Author Date Title University	phdthesis / mastersthesis	author year title school	Thesis / Dissertation	author year title institution
Conference Paper	Author Title Proceedings Title Place Date DOI	inproceedings	author title booktitle address year doi	Other Conference Presentation / Paper	author paper title conference name conference location year doi

- Do not include peer reviewed items in your BibTeX files if your proposal was submitted after 2016-01-25.
- For items awaiting publication, leave the year blank.

Note for non-peer-reviewed presentations:

- The Zotero item type is **Conference Paper**.
- Enter the conference name as the **Proceedings Title**. Do not enter the conference name as the Conference Name, as that field does not make it into Research.gov.

Note for theses and dissertations: When the Zotero Item Type is Thesis, Zotero exports the BibTeX type of phdthesis or mastersthesis by looking at the Type field (not to be confused with Item Type) for the item.

- The default is **phdthesis**, but you can specify the Type as Doctoral dissertation, dissertation, Ph.D. thesis, etc., if you want to be explicit. We recommend picking one and sticking with it.
- For **mastersthesis**, pick one of the following Type values: Masters, Masters thesis, Master thesis, M.S., MS
- BibTeX doesn't have a type for **undergraduate thesis**. You can specify Undergraduate thesis in the Type field in Zotero, but it will export as phdthesis in BibTeX. We currently do not have a best practice in how to handle this for Research.gov reporting.

Save the exported BibTeX file with extension .bib, and then upload to Research.gov.

After the upload, you can indicate whether each item was peer-reviewed and had Federal support. To that end, you may want to create Zotero Collections for each category. You can then export a BibTeX file for each collection and click the boxes in Research.gov efficiently.

- Consider organizing items into Zotero collections by Research.gov category, e.g., For NSF 2019 BibTex with Federal support, For NSF 2019 BibTex without Federal support.

A note on BibTeX and Curly Brackets

In BibTeX, {Curly Brackets} surround article titles, but they may also surround individual words to indicate that a formatter should leave the enclosed text alone. This is commonly used to preserve capital letters in titles some since formatters capitalize only the first word in a title. For example:

```
title = {My {Pacific} {Ocean} study}
```

Research.gov does not remove those extra brackets, so your NSF report may look ugly if your BibTeX file included them. If this bothers you, you can open the .bib file in a text editor and remove the extra brackets (but not the brackets surrounding the entire title), or you can post process the BibTeX file using a script or something like this bash command (works in Linux). Research.gov preserves capital letters even without the brackets.

Bash command provided by Mary Martin:

```
cat zotexport.bib | sed 's/{//2g' | rev | sed 's/}//2g' | rev >
zotexport_bracefilter.bib
```

That command removes all but the first opening curly bracket, {, and all but the last closing curly bracket, }. Since it's easy to remove all but the first opening bracket, that's what the first sed command does. For all but the last closing bracket, 'rev' reverses the order of characters, removes all but the first closing bracket, and then reverses the order back to original.

Input and output below:

==> zotexport.bib <==

```
@inproceedings{darby_connections_2019,
  address = {San Diego, CA},
  title = {Connections between {Gross} {N} {Cycling} and
{Exoenzyme} {Activity} across {Soil} {Depths} in {Three} {Northern}
{Hardwood} {Forests}},
```

```

        booktitle = {Soil {Science} {Society} of {America} {Annual}
{Meeting}},
        author = {Darby, B. A. and Goodale, C. G. and Chin, N. A. and
Fuss, C. B. and Lang, A. and Ollinger, S. V. and Lovett, G. M.},
        month = jan,
        year = {2019}
}

```

==> zotexport_bracefilter.bib <==

```

@inproceedings{darby_connections_2019,
    address = {San Diego, CA},
    title = {Connections between Gross N Cycling and Exoenzyme
Activity across Soil Depths in Three Northern Hardwood Forests},
    booktitle = {Soil Science Society of America Annual Meeting},
    author = {Darby, B. A. and Goodale, C. G. and Chin, N. A. and
Fuss, C. B. and Lang, A. and Ollinger, S. V. and Lovett, G. M.},
    month = jan,
    year = {2019}
}

```

Unpublished Journal Articles and Juried Conference Papers

- Use a collection, e.g., For NSF 2019 Bibliography, or a saved search to identify unpublished journal articles and juried conference papers that should be reported to NSF for the current annual report.
- For items awaiting publication, leave the year blank.

For unpublished journal articles and juried conference papers, Research.gov allows you enter a bibliographic citation for the item. The Zotero desktop application can export these items from either a selected set of items or an entire collection via the **Create Bibliography** context menu item.

The key here is to identify which items from your library to export. One method is to create a collection named Unpublished and place the items in there as you add items to your library. This requires you to remember to add the items to the collection.

Another method is to initiate an advanced search and then create a saved search for the desired items. An entry for the saved search is added beneath your collections. You can then click the saved search to see a list of items matching the search, select the items, and then export the bibliography. You'll probably want one search that find journal articles with Date Added in the past year (or for whatever time period the report applies) and for which the Date is

missing, and another search for juried conference papers added in the past year. This works as long as the various date fields are a reliable way of identifying all items needed for your report. However, the search may include items that are not critical enough to include in the NSF report, which is really supposed to be key products and not necessarily every single product from the past year.

You could also use tags or notes to flag the desired items. However, the thought process is similar to using collections, and we think dragging an item into a collection is less error prone than typing a tag, so we recommend collections over tags/notes for this purpose.

Supporting an Online Searchable Bibliography

Free tools for integrating your website with the [Zotero API](#):

- A. [ZotPress](#) - WordPress plugin for Zotero, in use at VCR and NGA. [See the Appendix for procedures used to go from EndNote to Zotero to ZotPress.](#)
- B. [JavaScript Search Client](#) - Designed for static websites, but hypothetically could be used anywhere. Used by BLE. Tim Whiteaker (BLE information manager) developed it and is likely willing to help you set it up for your site.
- C. [pyzotero](#) - Python wrapper for the API; may be useful for sites built with Django

The JavaScript Search Client has some features that depend on how you populate items in Zotero. You can use tags to categorize your items, for example with tags like `LTER-Funded` (funded by your site) and `LTER-Enabled` (not funded by your site, but uses your data). You can also supply data links in the form of DOIs by placing each DOI (with <https://doi.org/> in front of it) on its own line in the **Extra** field in Zotero, as in:

```
https://doi.org/10.18739/A2GX44T8M
https://doi.org/10.18739/A2MP4VN1H
```

Using Zotero for a Data Catalog and More

Items in Zotero aren't limited to traditional publications. You can have items that represent data, physical samples, and really just about anything you can imagine. This means you can use Zotero and its related applications to create an online searchable catalog of whatever you want, for free. The only drawback of this approach is if an item type is not already built into Zotero, then metadata fields and the search API for Zotero will not be as feature-rich as an application built for that item type. For example, Zotero cannot take advantage of many types of metadata stored in EML, whereas portals like EDI and the Arctic Data Center can. Still, there are examples where Zotero can work well beyond traditional publications.

BLE LTER uses Zotero to [catalog datasets related to BLE](#) that aren't stored at EDI. These datasets are in various repositories and have various connections to BLE, which works fine with Zotero. Behind the scenes, BLE LTER maintains a [Zotero collection for related data](#). Items in this collection were added using the Zotero Connector browser add-on, and then manually edited where metadata was lacking, particularly by assigning tags to identify the relationship to BLE. Even for items that are not traditional publications, many websites now include metadata that the Zotero Connector can harvest (EDI does very well at this), which makes it much easier to populate a related data catalog. To see more about how to best represent datasets in Zotero, see the [Zotero documentation on datasets](#). As of this writing, in a nutshell the practice is to use the "Document" type for datasets, include some typical metadata for datasets, and use the "Extra" to indicate that this item is actually a dataset and to store additional details such as version number and DOI. If you want to indicate previous versions, we recommend putting each previous version number and DOI on the same line, space delimited, as in the example below.

Example content of Extra field for datasets:

```
Type: dataset
Version: 3
DOI: 10.6073/PASTA/CA34BE7554DDC67C9FA0F8DEA01F375B
Previous Version: 2 DOI: 10.6073/PASTA/F7204A847A1D71FCE18ED880363E62F8
Previous Version: 1 DOI: 10.6073/pasta/8f9188936b08ef7cbe84ce3077487d6a
```

For item types other than datasets, start by seeing if the item type already exists in Zotero, and if not, see if there are any best practices on how to handle that type in Zotero. Then make sure that the available metadata fields in Zotero are sufficient for your item type. To supply metadata beyond what is well-defined in Zotero, take advantage of **Tags** and the **Extra** field. In particular, you can put whatever text you want in the Extra field to suit your application's needs.

Appendix A: From EndNote to ZotPress via Zotero

Procedure used at VCR to go from EndNote to ZotPress via Zotero:

1. Update the master SITE.enl library with any changes. Note any manually entered data requires accession numbers e.g. VCR_2006123100_50.
 1. If any reference changes (e.g. from in press to published) be sure to use the OLD accession number....., not a new one!
 2. Avoid paragraph markers in imported abstracts. They should all be one long string rather than multiple paragraphs.
2. Write an Endnote Export file by selecting the RIS filter, then exporting to a XML file.
 1. https://www.zotero.org/support/kb/importing_records_from_endnote has some additional settings if the RIS filter was previously unmodified.
3. Upload that file into Zotero -
 1. Open Zotero, logging in using the LTER account

2. Use the tool to select all the references in the overall Library and move them to the trash
 3. Upload RIS file using the IMPORT in the File menu
 4. Delete the OLD VCRLTERv2ris1 collection along with the items in it
 5. Rename your NEW collection to VCRLTERv2ris1
4. Read the new data into the web site
 1. Login to web site as administrator
 2. Use the Zotpress link in the dashboard to clear the cache
 3. Accounts tab, hit the GREEN clear cache button on the right – do NOT delete the account
 1. Browse to start repopulating the cache from the uploaded Zotero file
 2. Go to the main web site and click on bibliography “by author” to start generating the display version. It can take a while!

Appendix B: Batch Editing Zotero Content

For batch operations, like deleting all tags that begin with the letter Q, you may need to employ a [local JavaScript solution](#) or [cloud-based JavaScript solution using the API](#), or a [Python solution with pyzotero](#). Tim found pyzotero to be easier to use, but he’s also more of a Python guy than a JavaScript ninja.

Note that some batch tag management tasks can be performed using the Tag Selector pane in the bottom left corner of the Zotero desktop application. You can remove all automatically generated tags, delete a specific tag from all items by right-clicking it, or merge tags by renaming one tag to have the same tag as another (if both tags were used for an item, they are merged so you won’t get duplicate tags for that item). You can batch-add a tag by selecting all the items you want to add it to and dragging them onto the tag in the Tag Selector pane.

```
"""Sample Python code to update a Zotero library using pyzotero.
```

```
This example removes the 'Simmr' tag from all items, if it was  
automatically  
added by Zotero.
```

```
Requires pyzotero (pip install pyzotero).
```

```
For more info, see https://pyzotero.readthedocs.io/en/latest/
```

```
"""
```

```
from pyzotero import zotero
```

```
# Find user Id and keys at https://www.zotero.org/settings/keys
```

```

# Group Id is the integer in the URL for your group page
library_id = 5056957 # library or group Id
library_type = 'user' # user or group
api_key = 'pasteYourApiKeyHere' # https://www.zotero.org/settings/keys/new

zot = zotero.Zotero(library_id, library_type, api_key)
try:
    items = zot.items(limit=50)
    while True:
        for item in items:
            data = item['data']
            print(data['title'])
            tags_to_keep = []
            for tag in data['tags']:
                if 'type' in tag and tag['type'] == 1: # auto tags
                    if tag['tag'] != 'Simmr':
                        tags_to_keep.append(tag)
                else:
                    tags_to_keep.append(tag)
            if tags_to_keep != data['tags']:
                item['data']['tags'] = tags_to_keep
                zot.update_item(item)
                print('    Updated this item')
            items = zot.follow() # next set of items using same limit as above
except StopIteration:
    print('\nAll items processed')
except Exception as ex:
    print(ex)

```

Appendix C: What Others are Doing

Stace Beaulieu (NES) - Shares Zotero group with her team. Links to NES group page on Zotero's website from NES website.

Elizabeth Dobbins (NGA) - ZotPress user. Pls use EndNote separately. Interested in how to divvy up existing items in personal Zotero account for LTER use.

Marty Downs (NCO) - Has LTER Network Zotero group with ~20,000 items.

John Porter (VCR) - EndNote on backend, with periodic updates to Zotero. ZotPress user. Exports from EndNote to Research.gov.

Tim Whiteaker (BLE) - Using JavaScript search client on static HTML website.

Mary Martin (HBR) - Publications managed in Zotero. RIS output from Zotero is imported to Drupal Biblio (with a script to re-code some fields). Biblio author IDs are used to display pubs on people pages.

NGA - Uses ZotPress.