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Contributions by M.A. Rújula\*,  
J. Fernández\*, A. Barth\* & J.-M. Beckers\*



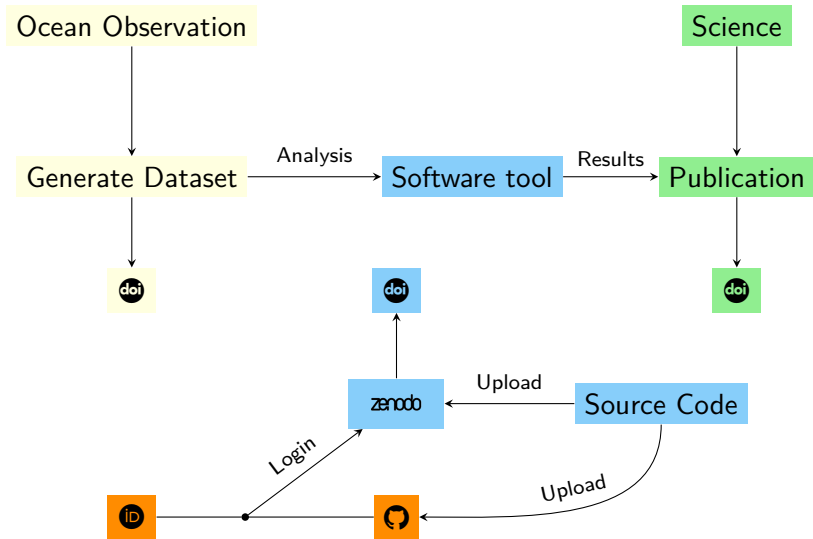
\*GHER - University of Liège

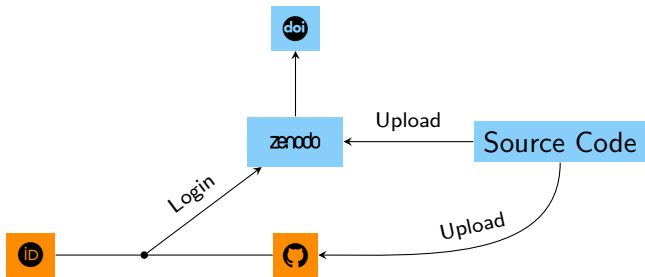
\*SOCIB Data Centre

*Software citation &  
process traceability*

# *Motivations:*

Reproducibility & Traceability





# Goals

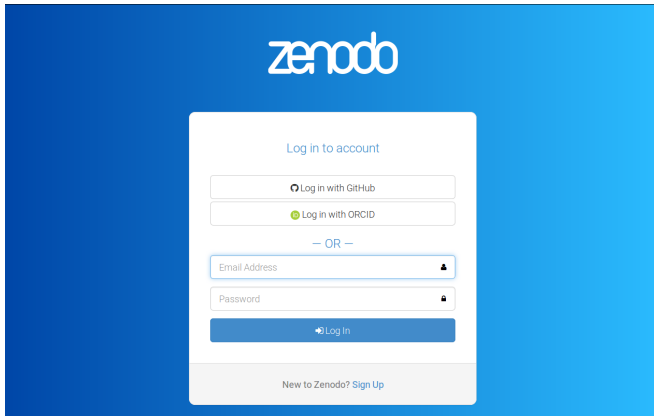
Reproducibility: **IF** same experiment  
identical parameters  
same dataset  
same model  
**THEN** same results

Traceability: all the elements used in the analysis/experiment:  
accessible  
properly described  
uniquely identified

# *A closer look to Zenodo*

# Login: 3 options

- 1 Use GitHub account
- 2 Use ORCID account
- 3 Create new user



The image shows the Zenodo login page. At the top, the Zenodo logo is displayed in white on a blue gradient background. Below the logo, the text "Log in to account" is centered. There are two buttons for social login: "Log in with GitHub" and "Log in with ORCID". Below these, a separator "— OR —" is shown. Then, there are two input fields: "Email Address" and "Password", each with a small icon on the right. A "Log In" button is positioned below the password field. At the bottom, a link "New to Zenodo? Sign Up" is provided.

zenodo

Log in to account

Log in with GitHub

Log in with ORCID

— OR —



Email Address


Password

Log In

New to Zenodo? Sign Up


# Main page: linked accounts


[Upload](#)[Communities](#)


 ctroupin@socib.es


[Home](#) / [Account](#) / [Linked accounts](#)


**Settings**


 [Profile](#)


 [Change password](#)

 [Linked accounts](#)


 [Applications](#)


 [Shared links](#)


 [GitHub](#)


 **Linked accounts**

Tired of entering password for Zenodo every time you sign in? Set up single sign-on with one or more of the services below:

 **GitHub** ✓  
Software collaboration platform, with one-click software preservation in Zenodo.

 [Disconnect](#)

 **ORCID** ✓  
Connecting Research and Researchers.

 [Disconnect](#)




[About](#)  
[About](#)  
[Contact](#)  
[Policies](#)

[Resources](#)  
[Features](#)  
[FAQ](#)

[Developers](#)  
[REST API](#)  
[DOI-PMH](#)

[Contribute](#)  
[GitHub](#)  
[Donate](#)

**Funded by**



Powered by [CERN Data Centre & Invenio](#)


[Privacy policy](#) [Terms of Use](#) [Support](#)



# Upload: you can drop anything









Drag and drop files here

— or —

 Choose files


(minimum 1 file required, max 50 GB per dataset - [contact us](#) for larger datasets)

Upload type required ▾

 Publication <input checked="" type="radio"/>	 Poster <input type="radio"/>	 Presentation <input type="radio"/>	 Dataset <input type="radio"/>	 Image <input type="radio"/>	 Video/Audio <input type="radio"/>	 Software <input type="radio"/>	 Lesson <input type="radio"/>
--	--	--	---	---	---	--	--

Publication type

Basic information required ▾

 Digital Object Identifier

Optional. Did your publisher already assign a DOI to your upload? If not, leave the field empty and we will register a new DOI for you. A DOI allows others to easily and unambiguously cite your upload. Please note that it is NOT possible to edit a Zenodo DOI once it has been registered by us, while it is always possible to edit a custom DOI.

☐ Pre-preserve DOI

In particular: Software

(ok for stable code)

# Upload: add metadata

## Digital Object Identifier

Optional. Did your publisher already assign a DOI to your upload? If not, leave the field empty and we will register a new DOI for you. A DOI allows others to easily and unambiguously cite your upload. Please note that it is NOT possible to edit a Zenodo DOI once it has been registered by us, while it is always possible to edit a custom DOI.

## Publication date \*

Required. Format: YYYY-MM-DD. In case your upload was already published elsewhere, please use the date of first publication.

## Title \*

Required.

## Authors \*

# Upload metadata: licence

License required ▾

**Access right \***

- ☒ Open Access
- ☐ Embargoed Access
- ☐ Restricted Access
- ☐ Closed Access

Required. Open access uploads have considerably higher visibility on Zenodo.

**License \***

GN

- GNU Affero General Public License v3**
- GNU Free Documentation License 1.3 with no cover texts and no invariant sections
- GNU General Public License 2.0
- GNU General Public License 3.0
- GNU Lesser General Public License 2.1

Not necessarily Open!

# Upload metadata: funding!

Funding

recommended

Zenodo is integrated into reporting lines for research funded by the European Commission via OpenAIRE (<http://www.openaire.eu>). Specify grants which have funded your research, and we will let your funding agency know!

Grants

SeaData

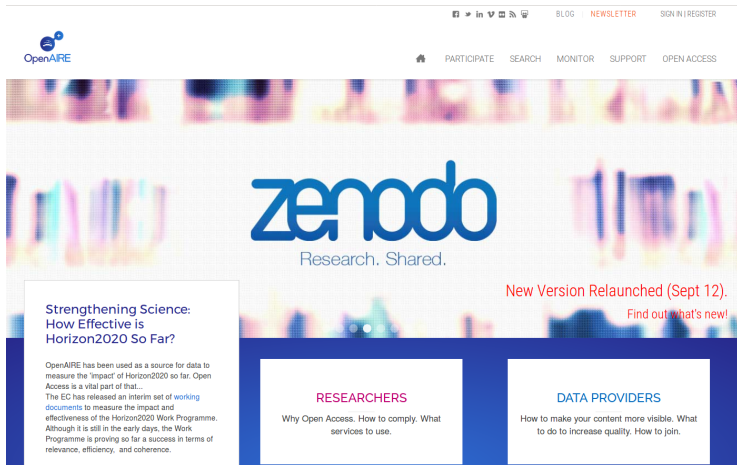
SeaDataCloud - Further developing the pan-European infrastructure for marine data

SeaDataNet II: Pan-European infrastructure for ocean and marine data management

+ Add another grant

Common strategy for SeaDataCloud or ODIP tools?

# Upload metadata: funding!



The screenshot shows the Zenodo website homepage. At the top, there is a navigation bar with social media icons (Facebook, Twitter, LinkedIn, YouTube, RSS, and a generic share icon) on the left, and links for 'BLOG', 'NEWSLETTER', and 'SIGN IN | REGISTER' on the right. Below this, the OpenAIRE logo is on the left, and a row of icons for 'PARTICIPATE', 'SEARCH', 'MONITOR', 'SUPPORT', and 'OPEN ACCESS' is on the right. The main banner features the Zenodo logo in large blue letters with the tagline 'Research. Shared.' below it. To the left of the banner, there is a white box with the title 'Strengthening Science: How Effective is Horizon2020 So Far?' and a paragraph of text. To the right, there is a red announcement: 'New Version Relunched (Sept 12). Find out what's new!'. At the bottom, there are two white boxes on a dark blue background. The left box is titled 'RESEARCHERS' and contains the text 'Why Open Access. How to comply. What services to use.' The right box is titled 'DATA PROVIDERS' and contains the text 'How to make your content more visible. What to do to increase quality. How to join.'

OpenAIRE

zenodo  
Research. Shared.

Strengthening Science:  
How Effective is  
Horizon2020 So Far?

OpenAIRE has been used as a source for data to measure the 'impact' of Horizon2020 so far. Open Access is a vital part of that...  
The EC has released an interim set of [working documents](#) to measure the impact and effectiveness of the Horizon2020 Work Programme. Although it is still in the early days, the Work Programme is proving so far a success in terms of relevance, efficiency, and coherence.

New Version Relunched (Sept 12).  
Find out what's new!

RESEARCHERS

Why Open Access. How to comply. What services to use.

DATA PROVIDERS

How to make your content more visible. What to do to increase quality. How to join.

Common strategy for SeaDataCloud or ODIP tools?

# Upload: finish

Related/alternate identifiers	recommended >
Contributors	optional >
References	optional >
Journal	optional >
Conference	optional >
Book/Report/Chapter	optional >
Thesis	optional >
Subjects	optional >

✖ Discard changes

Save

Publish

## About

About  
Policies  
Infrastructure  
Principles  
Contact

## Blog

Blog

## Help

FAQ  
Features  
What's New

## Developers

REST API  
OAIRMH

## Contribute

 GitHub  
 Donate







Funded by



*Zenodo &  
Github*

# Generating for software releases

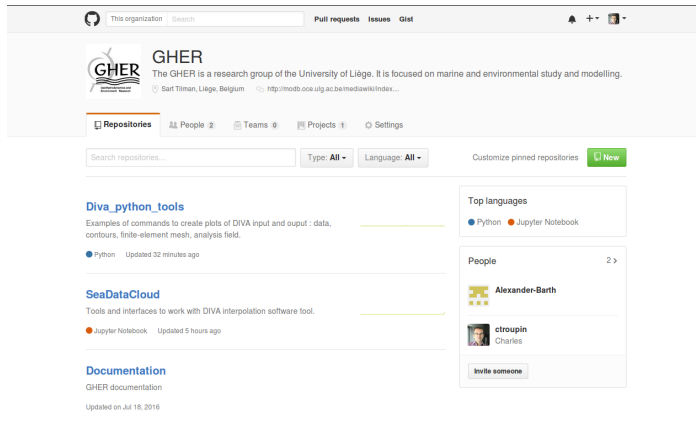
Turning synchronisation ON for the selected  repositories

 ctroupin/python-oceans	<input type="checkbox"/> OFF
 gher-ulg/Diva_python_tools	<input checked="" type="checkbox"/> ON
 gher-ulg/Documentation	<input type="checkbox"/> OFF
 gher-ulg/SeaDataCloud	<input checked="" type="checkbox"/> ON
 socib/CMEMS-INSTAC-Dashboard	<input type="checkbox"/> OFF
 socib/HFRadarReports	<input type="checkbox"/> OFF




# Generating for software releases

Go on your  home page



The screenshot shows the GitHub profile page for the organization 'GHER'. The header includes the GitHub logo, a search bar, and navigation links for 'Pull requests', 'Issues', and 'Gist'. The organization's name 'GHER' is prominently displayed, along with its description: 'The GHER is a research group of the University of Liège. It is focused on marine and environmental study and modelling.' Below this, the location 'Sart Tilman, Liège, Belgium' and a website link are provided. A horizontal menu shows 'Repositories' as the active section, with other options like 'People', 'Teams', 'Projects', and 'Settings'. A search bar for repositories is at the top of the main content area, followed by filters for 'Type' and 'Language'. The main content area lists three repositories: 'Diva\_python\_tools', 'SeaDataCloud', and 'Documentation'. Each repository entry includes a brief description, the programming language used (Python or Jupyter Notebook), and the time since it was last updated. On the right side, there are two sidebars: 'Top languages' showing 'Python' and 'Jupyter Notebook', and 'People' listing 'Alexander-Barth' and 'ctroupin' with an 'invite someone' button.

This organization Search Pull requests Issues Gist

 **GHER**  
The GHER is a research group of the University of Liège. It is focused on marine and environmental study and modelling.  
Sart Tilman, Liège, Belgium <http://modb.cee.ulg.ac.be/mediawiki/index...>

Repositories People 2 Teams 0 Projects 1 Settings

Search repositories... Type: All Language: All Customize pinned repositories New

**Diva\_python\_tools**  
Examples of commands to create plots of DIVA input and output : data, contours, finite-element mesh, analysis field.  
Python Updated 32 minutes ago

**SeaDataCloud**  
Tools and interfaces to work with DIVA interpolation software tool.  
Jupyter Notebook Updated 5 hours ago

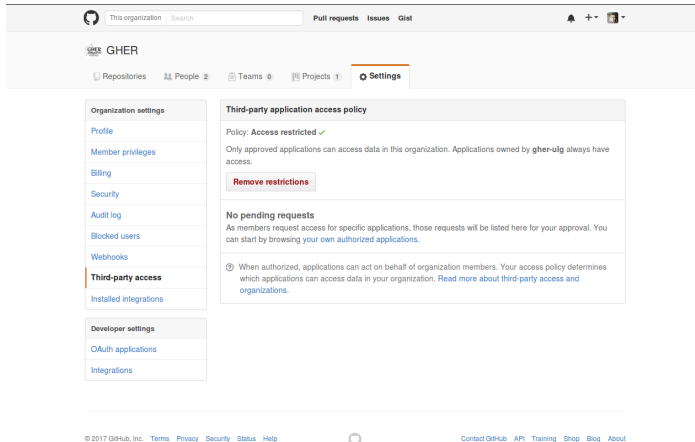
**Documentation**  
GHER documentation  
Updated on Jul 18, 2016

Top languages  
Python Jupyter Notebook


People 2 >  
Alexander-Barth  
ctroupin Charles  
invite someone

# Generating for software releases

## In settings: allow third-party access



The screenshot shows the GitHub organization settings page for 'GHER'. The top navigation bar includes 'Pull requests', 'Issues', and 'Gist'. The left sidebar lists various settings categories: Organization settings (Profile, Member privileges, Billing, Security, Audit log, Blocked users, Webhooks, **Third-party access**, Installed integrations), and Developer settings (OAuth applications, Integrations). The main content area is titled 'Third-party application access policy' and shows the current policy as 'Access restricted' with a green checkmark. A note states that only approved applications can access data, and applications owned by 'gher-ulg' always have access. A 'Remove restrictions' button is visible. Below this, the 'No pending requests' section explains that members request access for specific applications, and these requests are listed for approval. A help icon and a note explain that the access policy determines which applications can access data in the organization, with a link to 'Read more about third-party access and organizations'.

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# Generating for software releases

## Open the project repository



Examples of commands to create plots of DIVA input and output : data, contours, finite-element mesh, analysis field.

9 commits

1 branch

0 releases

1 contributor

Branch: master


New pull request

Create new file


Upload files

Find file

Clone or download

 ctroupin committed on GitHub Update README.md Latest commit 1e6cc79 an hour ago

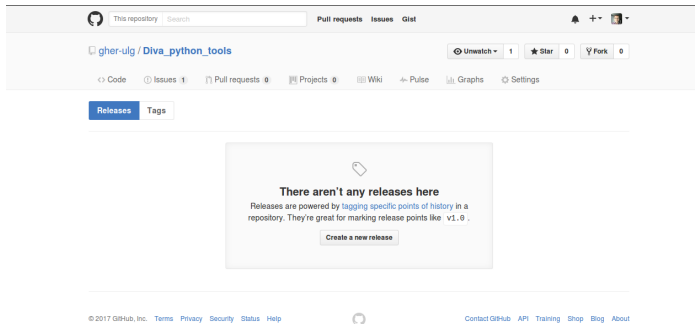
<a href="#">GHERFormat.py</a>	Reformatted code and small corrections	a year ago
<a href="#">README.md</a>	Update README.md	an hour ago
<a href="#">diva_plot_UV.py</a>	Reformatted code and small corrections	a year ago
<a href="#">diva_plot_contour.py</a>	minor changes	6 months ago
<a href="#">diva_plot_covafit.py</a>	Reformatted code and small corrections	a year ago
<a href="#">diva_plot_data.py</a>	Reformatted code and small corrections	a year ago
<a href="#">diva_plot_mesh.py</a>	minor changes	6 months ago
<a href="#">diva_plot_results.py</a>	Reformatted code and small corrections	a year ago

 README.md

## Diva\_python\_tools

# Generating for software releases

Click on the *Release* button



The screenshot shows the GitHub interface for the repository 'gher-ulg / Diva\_python\_tools'. At the top, there's a search bar and navigation links for 'Pull requests', 'Issues', and 'Gist'. Below the repository name, there are buttons for 'Unwatch', 'Star' (1), and 'Fork' (0). A horizontal menu contains links for 'Code', 'Issues' (1), 'Pull requests' (0), 'Projects' (0), 'Wiki', 'Pulse', 'Graphs', and 'Settings'. Below this menu, there are two tabs: 'Releases' (active) and 'Tags'. The main content area displays a message: 'There aren't any releases here'. It explains that releases are powered by tagging specific points of history and are great for marking release points like 'v1.0'. A button labeled 'Create a new release' is positioned at the bottom of this message box. The footer contains copyright information '© 2017 GitHub, Inc.' and links for 'Terms', 'Privacy', 'Security', 'Status', and 'Help' on the left, and 'Contact GitHub', 'API', 'Training', 'Shop', 'Blog', and 'About' on the right.

This repository Search


Pull requests Issues Gist

gher-ulg / Diva\_python\_tools

Unwatch 1 Star 0 Fork 0

Code Issues 1 Pull requests 0 Projects 0 Wiki Pulse Graphs Settings

Releases Tags



**There aren't any releases here**

Releases are powered by [tagging specific points of history](#) in a repository. They're great for marking release points like `v1.0`.

Create a new release

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# Generating for software releases

Fill in the information and ...

[Code](#) [Issues 1](#) [Pull requests 0](#) [Projects 0](#) [Wiki](#) [Pulse](#) [Graphs](#) [Settings](#)

[Releases](#) [Tags](#)

@ Target: master  
Choose an existing tag, or create a new tag on publish

[Write](#) [Preview](#) Markdown supported

Release with separated files for each plot, using the Basemap module.

Attach files by dragging & dropping, [selecting them](#), or pasting from the clipboard.

Attach binaries by dropping them here or [selecting them](#).

☐ **This is a pre-release**  
We'll point out that this release is identified as non-production ready.

[Publish release](#) [Save draft](#)

### Tagging suggestions

It's common practice to prefix your version names with the letter v. Some good tag names might be v1.0 or v2.3.4.

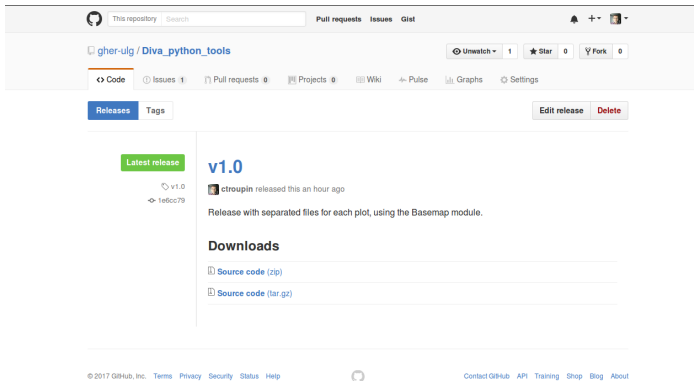
If the tag isn't meant for production use, add a pre-release version after the version name. Some good pre-release versions might be v0.2-alpha or v5.9-beta.3.

### Semantic versioning

If you're new to releasing software, we highly recommend reading about [semantic versioning](#).

# Generating for software releases

...make the release



The screenshot shows the GitHub interface for the repository 'gher-ulg / Diva\_python\_tools'. The top navigation bar includes 'Pull requests', 'Issues', and 'Gist'. The repository name is 'gher-ulg / Diva\_python\_tools', with 'Unwatch', 'Star' (1), and 'Fork' (0) buttons. The main navigation tabs are 'Code', 'Issues' (1), 'Pull requests' (0), 'Projects' (0), 'Wiki', 'Pulse', 'Graphs', and 'Settings'. Below these are 'Releases' and 'Tags' tabs, with 'Releases' being the active tab. The release section shows 'v1.0' as the latest release, released 'this an hour ago' by user 'ctroupin'. The release description is 'Release with separated files for each plot, using the Basemap module.' Under the 'Downloads' section, there are two links: 'Source code (zip)' and 'Source code (tar.gz)'. The footer contains copyright information '© 2017 GitHub, Inc.', links for 'Terms', 'Privacy', 'Security', 'Status', and 'Help', a GitHub logo, and links for 'Contact GitHub', 'API', 'Training', 'Shop', 'Blog', and 'About'.

This repository Search

Pull requests Issues Gist

gher-ulg / Diva\_python\_tools

Unwatch 1 Star 0 Fork 0

Code Issues 1 Pull requests 0 Projects 0 Wiki Pulse Graphs Settings

Releases Tags

Edit release Delete

Latest release

v1.0

ctroupin released this an hour ago

Release with separated files for each plot, using the Basemap module.

Downloads

Source code (zip)

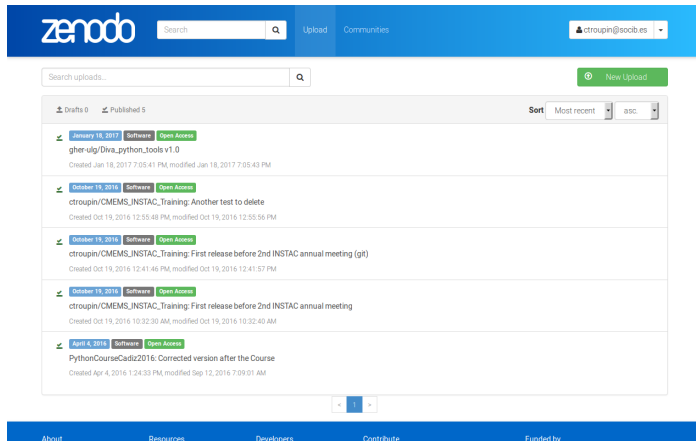
Source code (tar.gz)

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Contact GitHub API Training Shop Blog About

# Generating for software releases

Check the project release on Zenodo and ...



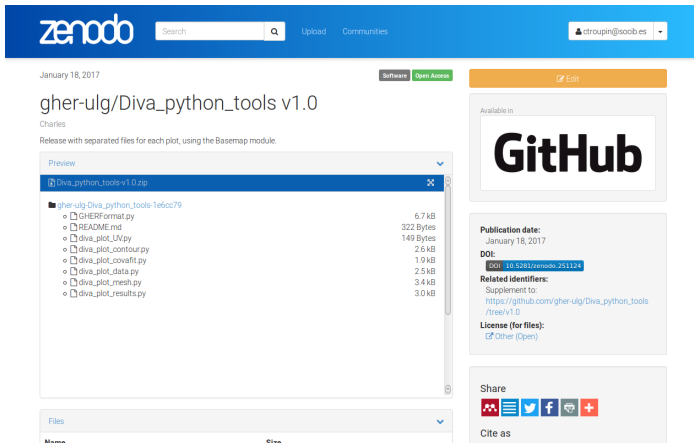
The screenshot displays the Zenodo web interface. At the top is a blue header with the Zenodo logo, a search bar, and navigation links for 'Upload' and 'Communities'. A user profile dropdown for 'ctroupin@socib.es' is visible on the right. Below the header is a secondary search bar labeled 'Search uploads...'. The main content area shows a list of uploads, with tabs for 'Drafts 0' and 'Published 5'. The list is sorted by 'Most recent' in 'asc' order. Five items are listed, each with a date, category (Software), and 'Open Access' status. The items are:

- January 18, 2017** | Software | Open Access | gher-ulg/Diva\_python\_tools v1.0  
Created Jan 18, 2017 7:05:41 PM, modified Jan 18, 2017 7:05:43 PM
- October 19, 2016** | Software | Open Access | ctroupin/CMEMS\_INSTAC\_Training: Another test to delete  
Created Oct 19, 2016 12:55:48 PM, modified Oct 19, 2016 12:55:56 PM
- October 19, 2016** | Software | Open Access | ctroupin/CMEMS\_INSTAC\_Training: First release before 2nd INSTAC annual meeting (git)  
Created Oct 19, 2016 12:41:46 PM, modified Oct 19, 2016 12:41:57 PM
- October 19, 2016** | Software | Open Access | ctroupin/CMEMS\_INSTAC\_Training: First release before 2nd INSTAC annual meeting  
Created Oct 19, 2016 10:32:30 AM, modified Oct 19, 2016 10:32:40 AM
- April 4, 2016** | Software | Open Access | PythonCourseCadiz2016: Corrected version after the Course  
Created Apr 4, 2016 1:24:33 PM, modified Sep 12, 2016 7:09:01 AM

At the bottom of the list is a pagination control showing '1' of 1 items. The footer contains links for 'About', 'Resources', 'Developers', 'Contribute', and 'Funded by'.

# Generating for software releases

...get the  badge



The screenshot shows the Zenodo interface for a software release. The header includes the Zenodo logo, a search bar, and navigation links for Upload and Communities. The user profile 'ctroupin@soib.es' is visible in the top right. The main content area displays the release details for 'gher-ulg/Diva\_python\_tools v1.0' by Charles, dated January 18, 2017. It includes a 'Software' badge, an 'Open Access' badge, and an 'Edit' button. A file tree is shown under the 'Preview' section, listing files like 'GHERFormat.py' and 'diva\_plot\_UV.py' with their respective sizes. To the right, there is a 'Available in' section featuring the GitHub logo. Below that, the 'Publication date' is listed as January 18, 2017, and the 'DOI' is 10.5281/zenodo.251124. The 'Related identifiers' section mentions a GitHub repository. The 'License (for files)' is set to 'Other (Open)'. At the bottom, there is a 'Share' section with social media icons and a 'Cite as' section.

zenodo Search Upload Communities ctroupin@soib.es

January 18, 2017 Software Open Access Edit

## gher-ulg/Diva\_python\_tools v1.0

Charles

Release with separated files for each plot, using the Basemap module.

Preview

- gher-ulg-Diva\_python\_tools-1e60c79
  - GHERFormat.py 6.7 kB
  - README.md 322 Bytes
  - diva\_plot\_UV.py 149 Bytes
  - diva\_plot\_contour.py 2.6 kB
  - diva\_plot\_covarfft.py 1.9 kB
  - diva\_plot\_data.py 2.5 kB
  - diva\_plot\_mesh.py 3.4 kB
  - diva\_plot\_results.py 3.0 kB

Files

Name	Size
------	------

Available in

# GitHub


**Publication date:**  
January 18, 2017

**DOI:**  
[DOI: 10.5281/zenodo.251124](https://doi.org/10.5281/zenodo.251124)

**Related identifiers:**  
Supplement to:  
[https://github.com/gher-ulg/Diva\\_python\\_tools/tree/v1.0](https://github.com/gher-ulg/Diva_python_tools/tree/v1.0)

**License (for files):**  
[Other \(Open\)](#)

**Share**




**Cite as**



# *Use case 1*

get DOI for Diva releases

# Diva (simplified) development history

- 1990's: Variational Interpolation Method (Fortran 77)  
only 2D interpolations
- 2006 SeaDataNet, code refactory and set of bash scripts
- 2007 🍌 with ODV
- 2008 code in Subversion (SVN), distribution through  
GHER web page
- 2009 new modules in Fortran 90  
for loops over depth and time
- 2012 new error calculation technique
- 2017 switch from SVN to **git**, distribution via 

# From SVN to Git and GitHub

## Easy way

- 1 Create a new repository with the latest release of the code
- 2 Lose all the history of the changes, the previous releases and developing branches



# From SVN to Git and GitHub

## Hard/conservative way

- 1 Git repository whose structure reflects that of SVN  
(trunk, branches, tags)
- 2 Use the `git-svn` bridge  
[https://git-scm.com/book/en/v2/  
Git-and-Other-Systems-Migrating-to-Git](https://git-scm.com/book/en/v2/Git-and-Other-Systems-Migrating-to-Git)
- 3 End up with a new GitHub repos with all the history

# Use-case: Diva releases

- 1 Switch from SVN to GitHub (conserving the history)

## Resources:

- ▶ <https://git-scm.com/book/en/v2/Git-and-Other-Systems-Migrating-to-Git>
- ▶ <http://john.albin.net/git/convert-subversion-to-git>
- ▶ <https://www.atlassian.com/git/tutorials/migrating-overview>

# Use-case: Diva releases

- 1 Switch from SVN to GitHub (conserving the history)
- 2 Enable Diva repository on Zenodo



# Use-case: Diva releases

- 1 Switch from SVN to GitHub (conserving the history)
- 2 Enable Diva repository on Zenodo
- 3 Edit the different *tags* on GitHub (otherwise DOI not generated)

The screenshot shows a GitHub repository page for the 'diva-4.6.5' tag. At the top, there are tabs for 'Releases' and 'Tags', with 'Tags' being the active tab. To the right of these tabs are 'Edit tag' and 'Delete' buttons. The main content area displays the tag name 'diva-4.6.5' in large blue text. Below it, a message states: 'swatelet tagged this on Apr 14, 2014 · 132 commits to master since this tag'. Further down, it says 'release 4.6.5'. A section titled 'Downloads' contains two links: 'Source code (zip)' and 'Source code (tar.gz)', each preceded by a download icon.

Releases Tags Edit tag Delete

diva-4.6.5  
17d7517

**diva-4.6.5**

swatelet tagged this on Apr 14, 2014 · 132 commits to master since this tag

release 4.6.5

**Downloads**

Source code (zip)

Source code (tar.gz)

## Use-case: Diva releases

- 1 Switch from SVN to GitHub (conserving the history)
- 2 Enable Diva repository on Zenodo
- 3 Edit the different *tags* on GitHub  
(otherwise DOI not generated)
- 4 To do? Include Diva corresponding DOI in product netCDF?



# Conclusions

1

# Conclusions

1

2

# Conclusions

1

2

3