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# IHEWAcollect Documentation

*Release unknown*

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# CONTENTS

<b>1</b>	<b>Installation</b>	<b>3</b>
1.1	Install from pip . . . . .	3
1.2	Install from source code . . . . .	3
1.3	Uninstall IHEWAc collect . . . . .	3
1.4	Optional data . . . . .	3
<b>2</b>	<b>Docker</b>	<b>5</b>
<b>3</b>	<b>Use</b>	<b>7</b>
<b>4</b>	<b>Products</b>	<b>9</b>
<b>5</b>	<b>Code of Conduct</b>	<b>11</b>
<b>6</b>	<b>Contents</b>	<b>13</b>
6.1	Tutorial . . . . .	13
6.1.1	Local environment . . . . .	13
6.1.2	Virtual environment . . . . .	13
6.2	License . . . . .	13
6.3	Authors . . . . .	23
6.4	Changelog . . . . .	23
6.4.1	Version 0.0.1 . . . . .	23
6.5	Contributing . . . . .	23
6.5.1	Code of Conduct . . . . .	23
6.5.2	Rights . . . . .	23
6.5.3	Issue Conventions . . . . .	24
6.5.4	Dataset Objects . . . . .	24
6.5.5	Git Conventions . . . . .	24
6.5.6	Code Conventions . . . . .	24
6.5.7	Development Environment . . . . .	25
6.5.7.1	Initial Setup . . . . .	25
6.5.7.2	Installing GDAL . . . . .	25
6.5.7.3	Python build requirements . . . . .	25
6.5.7.4	Installing IHEWAc collect . . . . .	26
6.5.7.5	Uninstalling IHEWAc collect . . . . .	26
6.5.7.6	Running the tests . . . . .	26
6.6	Development . . . . .	26
6.7	Products . . . . .	29
6.8	IHEWAc collect . . . . .	30
6.8.1	IHEWAc collect package . . . . .	30
6.8.1.1	Subpackages . . . . .	30

6.8.1.2	Submodules . . . . .	41
6.8.1.3	IHEWAcollection.download module . . . . .	41
6.8.1.4	Module contents . . . . .	42
<b>7</b>	<b>Indices and tables</b>	<b>43</b>
	<b>Python Module Index</b>	<b>45</b>
	<b>Index</b>	<b>47</b>

This is the documentation of **IHEWAc collect**.

**IHEWAc collect** is a collection of tools to download remote sensing data. This project is fully developed by Water Accounting team at IHE-Delft.

GDAL library is required, see [How to install GDAL](#).

**Warning:** Set gdal executable files to system “PATH”.

Must contain **accounts.yml** file, for security reason, we don’t suggest you to share **accounts.yml**, see [accounts.yml-example](#).

**accounts.yml-encrypted** is safe to be shared, it can be generated by `generate_encrypt()` function.

**accounts.yml-credential** contains your password and key, to encrypt **accounts.yml-encrypted**.



## INSTALLATION

### 1.1 Install from pip

IHEWAc collect Python package is hosted on [Python Package Index \(PyPI\)](#).

Install from pip.

```
$ pip install IHEWAc collect
```

### 1.2 Install from source code

Download source code from [Github](#).

```
$ git clone https://github.com/wateraccounting/IHEWAc collect.git  
$ cd IHEWAc collect
```

Install from source code.

```
$ python setup.py install
```

### 1.3 Uninstall IHEWAc collect

```
$ pip uninstall IHEWAc collect
```

### 1.4 Optional data

Test data can be download from [IHE FTP](#).

Save the test data to “IHEWAc collect/tests/data/Products” folder.





## DOCKER

Set “System -> Base Memory” to max capacity in Virtual Machine.

Set “Shared Folders” in Virtual Machine.

- Folder Path: D:\IHEWAcollect
- Folder Name: d/IHEWAcollect
- Auto-mount: Yes
- Make Permanent: Yes

Download source code from [Github](#).

```
$ git clone https://github.com/wateraccounting/IHEWAcollect.git  
$ cd IHEWAcollect
```

Restart Docker Virtual Machine image.

```
$ docker-machine restart
```

Pull the ihewacollect image.

```
$ docker pull wateraccounting/ihewacollect
```

Or build from source code.

```
$ docker build -t wateraccounting/ihewacollect .
```

Check images.

```
$ docker images
```

Check ip address.

```
$ docker-machine env  
export DOCKER_HOST="tcp://192.168.99.100:2376"
```

Run the image with Jupyter Notebook. To access Jupyter <http://192.168.99.100:8888/>

```
$ docker run -it --name ihewacollect -p 8888:8888 -v /d/IHEWAcollect:/notebooks  
↪wateraccounting/ihewacollect
```

Check running image (container), in the new cmd window.

```
$ docker container list
```

Access to running image, in the new cmd window.

```
$ docker exec -it ihewacollect bash  
$ cd /notebooks/  
$ python3 setup.py install  
$ python3 ./examples/ex_CFSR_GRIB.py
```

Clean running cache.

```
$ docker system prune -f && docker volume prune -f && docker container prune -f
```

Remove image.

```
$ docker rmi wateraccounting/ihewacollect
```

Examples can be found at [examples](#).

```
import os
import IHEWAccollect

path = os.getcwd()
file_accounts = os.path.join(path, 'accounts.yml')
file_credential = os.path.join(path, 'accounts.yml-credential')
file_encrypted = os.path.join(path, 'accounts.yml-encrypted')

if os.path.exists(file_accounts) or os.path.exists(file_encrypted):
    product = 'CFSR'
    version = 'v1'
    parameter = 'radiation'
    resolution = 'daily'
    variable = 'dlwsfc'
    bbox = {
        'w': -19.0,
        'n': 38.0,
        'e': 55.0,
        's': -35.0
    }
    period = {
        's': '2008-01-01',
        'e': '2008-01-31'
    }
    nodata = -9999

    IHEWAccollect.Download(workspace=path,
                           product=product,
                           version=version,
                           parameter=parameter,
                           resolution=resolution,
                           variable=variable,
                           bbox=bbox,
                           period=period,
                           nodata=nodata,
                           is_status=False)
```



## PRODUCTS

Details can be found at [Products](#).

Product	Link
ASCAT	<a href="https://www.copernicus.eu">https://www.copernicus.eu</a>
CFSR	<a href="https://www.noaa.gov">https://www.noaa.gov</a>
CHIRPS	<a href="https://geog.ucsb.edu">https://geog.ucsb.edu</a>
CSR	<a href="https://podaac.jpl.nasa.gov">https://podaac.jpl.nasa.gov</a>
DEM	<a href="http://earlywarning.usgs.gov">http://earlywarning.usgs.gov</a>
ECMWF	<a href="https://www.ecmwf.int">https://www.ecmwf.int</a>
FEWS	<a href="https://earlywarning.usgs.gov/fews">https://earlywarning.usgs.gov/fews</a>
GLDAS	<a href="https://ldas.gsfc.nasa.gov/gldas">https://ldas.gsfc.nasa.gov/gldas</a>
GLEAM	<a href="http://www.gleam.eu">http://www.gleam.eu</a>
GPM	<a href="https://pmm.gsfc.nasa.gov/GPM">https://pmm.gsfc.nasa.gov/GPM</a>
HiHydroSoil	<a href="#">No longer provided. Download current version from: <a href="http://www.futurewater.eu/projects/hihydrosoil/">www.futurewater.eu/projects/hihydrosoil/</a></a>
JRC	<a href="https://global-surface-water.appspot.com">https://global-surface-water.appspot.com</a>
MCD12Q1	<a href="https://lpdaac.usgs.gov/products/mcd12q1v006">https://lpdaac.usgs.gov/products/mcd12q1v006</a>
MCD43A3	<a href="https://lpdaac.usgs.gov/products/mcd43a3v006">https://lpdaac.usgs.gov/products/mcd43a3v006</a>
MOD09GQ	<a href="https://lpdaac.usgs.gov/products/mod09gqv006">https://lpdaac.usgs.gov/products/mod09gqv006</a>
MOD10A2	<a href="https://nsidc.org/data/MOD10A2/versions/6">https://nsidc.org/data/MOD10A2/versions/6</a>
MOD11A2	<a href="https://lpdaac.usgs.gov/products/mod11a2v006">https://lpdaac.usgs.gov/products/mod11a2v006</a>
MOD13Q1	<a href="https://lpdaac.usgs.gov/products/mod13q1v006">https://lpdaac.usgs.gov/products/mod13q1v006</a>
MOD15A2H	<a href="https://lpdaac.usgs.gov/products/mod15a2hv006">https://lpdaac.usgs.gov/products/mod15a2hv006</a>
MOD16A2	<a href="https://lpdaac.usgs.gov/products/mod16a2v006">https://lpdaac.usgs.gov/products/mod16a2v006</a>
MOD17A2H	<a href="https://lpdaac.usgs.gov/products/mod17a2hv006">https://lpdaac.usgs.gov/products/mod17a2hv006</a>
MOD17A3H	<a href="https://lpdaac.usgs.gov/products/mod17a3hv006">https://lpdaac.usgs.gov/products/mod17a3hv006</a>
MSWEP	<a href="https://princetonclimate.com">https://princetonclimate.com</a>
PROBAV	<a href="http://proba-v.vgt.vito.be/en">http://proba-v.vgt.vito.be/en</a>
RFE	<a href="https://data.noaa.gov/dataset">https://data.noaa.gov/dataset</a>
SoilGrids	<a href="https://www.isric.org">https://www.isric.org</a>
TRMM	<a href="https://pmm.nasa.gov/trmm">https://pmm.nasa.gov/trmm</a>
TWC	<a href="https://www.wateraccounting.org">https://www.wateraccounting.org</a>



## **CODE OF CONDUCT**

- Be friendly and patient
- Be welcoming
- Be considerate
- Be respectful
- Be careful in the words that you choose
- When we disagree, try to understand why





## CONTENTS

### 6.1 Tutorial

We prepare solutions for different environment to use **IHEWAc collect**,

- Local environment
- Virtual environment

#### 6.1.1 Local environment

#### 6.1.2 Virtual environment

### 6.2 License

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If the program does terminal interaction, make it output a short

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## 6.4 Changelog

### 6.4.1 Version 0.0.1

- Template of CHANGELOG.RST!
- Feature A added
- FIX: nasty bug #1729 fixed

## 6.5 Contributing

Welcome to the IHE WaterAccounting Collect Tool (IHEWAc collect) project. Here's how we work.

### 6.5.1 Code of Conduct

First of all: the IHEWAc collect project has a code of conduct. Please read the CODE\_OF\_CONDUCT.txt file, it's important to all of us.

### 6.5.2 Rights

The GNU General Public License v3.0 license (see LICENSE.rst) applies to all contributions.

### 6.5.3 Issue Conventions

The IHEWAc collect issue tracker is for actionable issues.

Questions about installation, distribution, and usage should be taken to the project's [#issue](https://wateraccounting.slack.com). Opened issues which fall into one of these three categories may be perfunctorily closed.

Questions about development of IHEWAc collect, brainstorming, requests for comment, and not-yet-actionable proposals are welcome in the project's [#idea](https://wateraccounting.slack.com).

IHEWAc collect is a relatively new project and highly active. We have bugs, both known and unknown.

Please search existing issues, open and closed, before creating a new one.

IHEWAc collect employs Geospatial modules, so bug reports very often hinge on the following details:

- Operating system type and version (Windows? Ubuntu 12.04? 14.04?)
- The version and source of GDAL (UbuntuGIS? Homebrew?)

### 6.5.4 Dataset Objects

Our term for the kind of object that allows read and write access to raster data is *dataset object*. A dataset object might be an instance of *DatasetReader* or *DatasetWriter*. The canonical way to create a dataset object is by using the *IHEWAc collect.GIS.OpenAsArray()* function.

This is analogous to Python's use of [file object](#).

### 6.5.5 Git Conventions

We use a variant of centralized workflow described in the [Git Book](#). We have no 1.0 release for IHEWAc collect yet and we are tagging and releasing from the master branch. Our post-1.0 workflow is to be decided.

Work on features in a new branch of the mapbox/IHEWAc collect repo or in a branch on a fork. Create a [GitHub pull request](#) when the changes are ready for review. We recommend creating a pull request as early as possible to give other developers a heads up and to provide an opportunity for valuable early feedback.

### 6.5.6 Code Conventions

IHEWAc collect supports Python 2 and Python 3 in the same code base, which is aided by an internal compatibility module named `compat.py`. It functions similarly to the more widely known `six` but we only use a small portion of the features so it eliminates a dependency.

We strongly prefer code adhering to [PEP8](#).

Tests are mandatory for new features. We use [pytest](#).

We aspire to 100% coverage for Python modules [Coveralls](#).

### 6.5.7 Development Environment

Developing IHEWAc collect requires Python 2.7 or any final release after and including 3.4. We prefer developing with the most recent version of Python but recognize this is not possible for all contributors. See the Windows install instructions in the [readme](#) for more information about building on Windows.

#### 6.5.7.1 Initial Setup

First, clone IHEWAc collect's git repo:

```
$ git clone https://github.com/wateraccounting/ihewacollect.git
```

Development should occur within a [virtual environment](#) to better isolate development work from custom environments.

In some cases installing a library with an accompanying executable inside a virtual environment causes the shell to initially look outside the environment for the executable. If this occurs try deactivating and reactivating the environment.

#### 6.5.7.2 Installing GDAL

The GDAL library and its headers are required to build IHEWAc collect. We do not have currently have guidance for any platforms other than Linux and OS X.

On Linux, GDAL and its headers should be available through your distro's package manager. For Ubuntu the commands are:

```
$ sudo add-apt-repository ppa:ubuntugis/ppa
$ sudo apt-get update
$ sudo apt-get install gdal-bin libgdal-dev
```

On OS X, Homebrew is a reliable way to get GDAL.

```
$ brew install gdal
```

#### 6.5.7.3 Python build requirements

Provision a virtualenv with IHEWAc collect's build requirements. IHEWAc collect's `setup.py` script will not run unless Cython and Numpy are installed, so do this first from the IHEWAc collect repo directory.

Linux users may need to install some additional Numpy dependencies:

```
$ sudo apt-get install libatlas-dev libatlas-base-dev gfortran
```

then:

```
$ pip install -U pip
$ pip install -r requirements-dev.txt
```

#### 6.5.7.4 Installing IHEWAccollect

Installing IHEWAccollect in editable mode while developing is very convenient but only affects the Python files.

```
$ python setup.py install
```

#### 6.5.7.5 Uninstalling IHEWAccollect

```
$ pip uninstall IHEWAccollect
```

#### 6.5.7.6 Running the tests

IHEWAccollect's tests live in `python setup.py test` and generally match the main package layout.

To run the entire suite and the code coverage report:

```
$ python setup.py test
```

## 6.6 Development

Download source code from [Github](https://github.com/wateraccounting/IHEWAccollect).

```
$ git clone https://github.com/wateraccounting/IHEWAccollect.git
$ cd IHEWAccollect
```

In the PyCharm IDE, change “Project Structure -> Source Folders” to “src”

From the root of the project

```
$ python setup.py --version
```

Format scripts by PEP8

```
$ autopep8 --in-place --aggressive src/IHEWAccollect/base/base.py
```

Flake8, pre-commit

```
$ pre-commit install

$ pre-commit run --all-files
[INFO] Initializing environment for git://github.com/pre-commit/pre-commit-hooks.
[INFO] Initializing environment for https://github.com/pre-commit/mirrors-isort.
[INFO] Installing environment for git://github.com/pre-commit/pre-commit-hooks.
[INFO] Once installed this environment will be reused.
[INFO] This may take a few minutes...
[INFO] Installing environment for https://github.com/pre-commit/mirrors-isort.
[INFO] Once installed this environment will be reused.
[INFO] This may take a few minutes...
```

Unit test

```
$ python setup.py test
```

Read the Docs

```
$ python setup.py doctest
```

```
$ python setup.py docs
```

Upload to PyPI

1. In IDE, **commit** the changes “**v0.0.1**”
2. In IDE, **Version Control -> Log**, select this commit
3. In IDE, add version tag, select **VCS -> Git -> tag**
4. In IDE, **Tag window -> Tag Name**, type “**v0.0.1**”
5. In cmd, build package, type `python setup.py sdist bdist_wheel`
6. In cmd, validate build, type `twine check dist/IHEWAc collect-0.0.1*`
7. In cmd, upload build, type `twine upload dist/IHEWAc collect-0.0.1*`
8. In IDE, **push** the commit, with Tag label: “*HEAD*”, “*master*”, “*v0.0.1*”
9. In Github, select **Release** to “create a new release” or “Draft a new release”
10. In Github, **Tag version**, type “**v0.0.1**”
11. In Github, @ **Target**, select this commit
12. In Github, **Publish release**





## 6.7 Products

Table 1: Product Detail

id	variable	product	account	protocol	version	freq.	parameters	resolution	lat_s	lat_n	time_s	time_e
1	Albedo	MCD43A3	NASA	HTTPS	v6	daily	Albedo AlbedoBSA	500m	Global	Global	24/02/2000	contin- ues
2	Digital Elevation Map	HydroSHEDS	None	HTTPS	v1	n/a	DEM	3s 15s 30s			n/a	n/a
3	Equivalent Water Height	GRACE-FO- CSR/GFZ/DAAC	DAAC	HTTPS	v3.1	daily	EWB	1°	-90	90	01/04/2000	06/2017
4	Equivalent Water Height	GRACE-FO- DAAC CSR/GFZ/JPL	DAAC	HTTPS	v3.2	daily	EWB	1°	-90	90	01/06/2018	contin- ues
5	Evapo- transpira- tion	GLDAS	NASA	HTTPS	v2.1	3 hourly monthly	ETa	0.25°	-60	90	01/01/2000	contin- ues
6	Evapo- transpira- tion	GLEAM	GLEAM	SFTP	v3.3a v3.3b	daily monthly	ETa	0.25°	-90	90	01/01/1980	12/2018
7	Evapo- transpira- tion	MOD16A2	NASA	HTTPS	v6	8-day	ETA	500m	Global	Global	01/01/2000	contin- ues
8	Evapo- transpira- tion	SSE-Bop	None	HTTPS	v4	monthly	ETa	1km	-60	80	01/01/2000	contin- ues
9	Flow Di- rec- tion Map	HydroSHEDS	None	HTTPS	v1	n/a	DIR	3s 15s 30s			n/a	n/a
10	Gross Pri- mary Pro- duc- tion	MOD17A2	NASA	HTTPS	v6	8-day	GPP	500m	Global	Global	18/02/2000	contin- ues
11	Global Land Cover	MCD12Q1	NASA	HTTPS	v6	yearly	LC	500m	Global	Global	01/01/2001	12/2018
12	Land Sur- face Temperature	MOD11A2	NASA	HTTPS	v6	8-day	LST- day LST- night	1km	Global	Global	18/02/2000	contin- ues

## 6.8 IHEWAc collect

### 6.8.1 IHEWAc collect package

#### 6.8.1.1 Subpackages

#### IHEWAc collect.base package

#### Submodules

#### IHEWAc collect.base.base module

#### Base

#### Examples:

```
from IHEWAc collect.base import Base

base = Base(product='CFSR', is_print=True)
```

```
class IHEWAc collect.base.base.Base(product, is_print)
```

Bases: `object`

This Base class

Load base.yml file.

#### Parameters

- **product** (*str*) – Product name of data products.
- **is\_print** (*bool*) – Is to print status message.

```
classmethod check_conf(key, is_print) → dict
```

Check configuration information

This is the function to get user's configuration data.

#### Don't synchronize the details to github.

- File to read: `collect.yml`.

#### Parameters

**key** (*str*) – Key name.

#### Returns

Configuration data.

#### Return type

`dict`

#### Example

```
>>> from IHEWAc collect.base.base import Base
>>> conf = Base.check_conf('data', is_print=False)
>>> conf['messages'][0]
{'msg': 'No error', 'level': 0}
```

**check\_input**(*vname*, *rtype*, *vdata*) → *bool*

**get\_conf**(*key*) → *dict*

Get configuration information

This is the function to get project's configuration data.

**Parameters**

**key** (*str*) – Key name.

**Returns**

Configuration data.

**Return type**

*dict*

**Example**

```
>>> import os
>>> from IHEWAc collect.base.base import Base
>>> base = Base(is_print=False)
>>> file = base.get_conf('file')
>>> print(file)
base.yml
```

**get\_status**() → *str*

Get status

This is the function to get project status.

**Returns**

Status message.

**Return type**

*str*

**status** = 'Global status.'

## IHEWAc collect.base.exception module

### Exception

<https://julien.danjou.info/python-exceptions-guide/>

**exception** IHEWAc collect.base.exception.IHEClassInitError(*mod*, *msg=None*)

Bases: *Exception*

IHEClassInitError Class

**Parameters**

- **mod** (*str*) – Module name.
- **msg** (*bool*) – Extra message.

**exception** IHEWAc collect.base.exception.IHEFileError(*file*, *msg=None*)

Bases: *Exception*

IHEFileError Class

**Parameters**

- **file** (*str*) – File name.
- **msg** (*bool*) – Extra message.

**exception** IHEWAc collect.base.exception.IHEKeyError(*key, val, msg=None*)

Bases: [Exception](#)

IHEKeyError Class

#### Parameters

- **key** (*str*) – Key name.
- **val** (*list*) – Key name list.
- **msg** (*bool*) – Extra message.

**exception** IHEWAc collect.base.exception.IHEPassError(*vname, msg=None*)

Bases: [Exception](#)

IHEPassError Class

#### Parameters

- **vname** (*str*) – Account name.
- **msg** (*bool*) – Extra message.

**exception** IHEWAc collect.base.exception.IHEStringError(*vname, msg=None*)

Bases: [Exception](#)

IHEStringError Class

#### Parameters

- **vname** (*str*) – Variable name.
- **msg** (*bool*) – Extra message.

**exception** IHEWAc collect.base.exception.IHETypeError(*vname, rtype, vdata, msg=None*)

Bases: [Exception](#)

IHETypeError Class

#### Parameters

- **vname** (*str*) – Variable name.
- **rtype** (*str*) – Required type.
- **vdata** (*float*) – Variable value.
- **msg** (*bool*) – Extra message.

## IHEWAc collect.base.user module

### User

Before use this module, set account information in the `accounts.yml` file.

#### Examples:

```
from IHEWAc collect.base.user import User

user = User(workspace=path, product='CFSR', is_print=True)
```

**Note:**

1. Create `accounts.yml` under root folder of the project, based on the `config-example.yml`.
2. Run `User.credential.encrypt_cfg(path, file, password)` to generate `accounts.yml-encrypted` file.
3. Save key to `credential.yml`.

**class** IHEWAc collect.base.user.User(workspace, product, is\_print, \*\*kwargs)

Bases: `Base`

This User class

Description

**Parameters**

- **workspace** (`str`) – Directory to `accounts.yml`.
- **product** (`str`) – Product name of data products.
- **is\_print** (`bool`) – Is to print status message.
- **kwargs** (`dict`) – Other arguments.

**generate\_encrypt()**

Generate encrypted files

**get\_user(key)**

Get user information

This is the function to get user's configuration data.

**Don't synchronize the details to github.**

- File to read: `accounts.yml-credential` contains key: `accounts.yml-encrypted`.
- File to read: `accounts.yml-encrypted` generated from: `accounts.yml`.

**Parameters**

**key** (`str`) – Key name.

**Returns**

User data.

**Return type**

`dict`

**Example**

```
>>> import os
>>> from IHEWAc collect.base.user import User
>>> user = User(os.getcwd(), 'FTP_WA_GUESS', is_print=False)
>>> account = user.get_user('account')
>>> account['FTP_WA_GUESS']
{'username': 'wateraccountingguest', 'password': 'W@t3r@ccounting', ..
↪ .
>>> accounts = user.get_user('accounts')
Traceback (most recent call last):
```

(continues on next page)

(continued from previous page)

```
...
KeyError:
```

```
set_status(fun="", prt=False, ext="")
```

Set status

**Parameters**

- **fun** (*str*) – Function name.
- **prt** (*bool*) – Is to print on screen?
- **ext** (*str*) – Extra message.

```
status = 'Global status.'
```

**Module contents**

IHEWAc collect base modules

**IHEWAc collect.scripts package****Submodules****IHEWAc collect.scripts.credential module****IHEWAc collect.scripts.main module**

Main command group for WaterAccounting Collect's CLI.

**IHEWAc collect.scripts.skeleton module**

This is a skeleton file that can serve as a starting point for a Python console script. To run this script uncomment the following lines in the [options.entry\_points] section in setup.cfg:

```
console_scripts =
    fibonacci = IHEWAc collect.skeleton:run
```

Then run *python setup.py install* which will install the command *fibonacci* inside your current environment. Besides console scripts, the header (i.e. until `_logger...`) of this file can also be used as template for Python modules.

---

**Note:** This skeleton file can be safely removed if not needed!

---

**IHEWAc collect.scripts.skeleton.fib(*n*)**

Fibonacci example function

**Parameters****n** (*int*) – integer**Returns**

n-th Fibonacci number

**Return type**`int``IHEWAc collect.scripts.skeleton.main(args)`

Main entry point allowing external calls

**Parameters****args** (`[str]`) – command line parameter list`IHEWAc collect.scripts.skeleton.parse_args(args)`

Parse command line parameters

**Parameters****args** (`[str]`) – command line parameters as list of strings**Returns**

command line parameters namespace

**Return type**`argparse.Namespace``IHEWAc collect.scripts.skeleton.run()`

Entry point for console\_scripts

`IHEWAc collect.scripts.skeleton.setup_logging(loglevel)`

Setup basic logging

**Parameters****loglevel** (`int`) – minimum loglevel for emitting messages**Module contents**

IHEWAc collect script modules

**IHEWAc collect.templates package****Subpackages****IHEWAc collect.templates.EU package****Submodules****IHEWAc collect.templates.EU.Copernicus module****IHEWAc collect.templates.EU.ECMWF module****IHEWAc collect.templates.EU.GLEAM module****IHEWAc collect.templates.EU.JRC module****Module contents**

## IHEWAc collect.templates.FAO package

### Submodules

IHEWAc collect.templates.FAO.WaPOR module

IHEWAc collect.templates.FAO.WaporAPI module

**Authors: Bich Tran**

IHE Delft 2019

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### Module contents

IHEWAc collect.templates.HydroSHEDS package

### Submodules

IHEWAc collect.templates.HydroSHEDS.DEM module

### Module contents

IHEWAc collect.templates.IHE package

### Submodules

IHEWAc collect.templates.IHE.ALEXI module

IHEWAc collect.templates.IHE.CMRSET module

IHEWAc collect.templates.IHE.ETmonitor module

IHEWAc collect.templates.IHE.ETmonitor\_create module

IHEWAc collect.templates.IHE.HiHydroSoil module

IHEWAc collect.templates.IHE.SEBS module

IHEWAc collect.templates.IHE.TWC module

### Module contents

IHEWAc collect.templates.ISRIC package

### Submodules



IHEWAc collect.templates.ISRIC.SoilGrids module

Module contents

IHEWAc collect.templates.MSWEP package

Module contents

IHEWAc collect.templates.NASA package

Submodules

IHEWAc collect.templates.NASA.CSR module

IHEWAc collect.templates.NASA.GFZ module

IHEWAc collect.templates.NASA.GLDAS module

IHEWAc collect.templates.NASA.GPM module

IHEWAc collect.templates.NASA.JPL module

IHEWAc collect.templates.NASA.PODAAC module

IHEWAc collect.templates.NASA.TRMM module

Module contents

IHEWAc collect.templates.NOAA package

Submodules

IHEWAc collect.templates.NOAA.CFSR module

IHEWAc collect.templates.NOAA.RFE module

Module contents

IHEWAc collect.templates.USGS package

Submodules

IHEWAc collect.templates.USGS.CHIRPS module

IHEWAc collect.templates.USGS.FEWS module

IHEWAc collect.templates.USGS.MODIS\_products module

IHEWAc collect.templates.USGS.SSEBop module

Module contents

IHEWAc collect.templates.VITO package

Submodules

IHEWAc collect.templates.VITO.ASCAT module

IHEWAc collect.templates.VITO.PROBAV module

Module contents

Submodules

IHEWAc collect.templates.collect module

IHEWAc collect.templates.download\_tiles\_test module

IHEWAc collect.templates.dtime module

Dtime

Examples:

```
from IHEWAc collect.templates.dtime import Dtime

dtime = Dtime(workspace=path, is_print=True)
```

```
class IHEWAc collect.templates.dtime.Dtime(_Dtime__status, _Dtime__conf, **kwargs)
```

Bases: `object`

```
conf = {'data': {}, 'dtime': {'i': 0, 'r': []}, 'file': {'i': '', 'o': ''},
'path': '', 'time': {'e': datetime.datetime(2023, 4, 5, 12, 59, 47, 295456),
's': datetime.datetime(2023, 4, 5, 12, 59, 47, 295448)}}
```

```
get_time_range(dtime_s, dtime_e, arg_resolution)
```

```
set_status(fun="", prt=False, ext="")
```

Set status

Parameters

- **fun** (*str*) – Function name.
- **prt** (*bool*) – Is to print on screen?
- **ext** (*str*) – Extra message.

```
status = 'Global status.'
```

## IHEWAc collect.templates.gis module

## IHEWAc collect.templates.util module

### utils

Utilities for IHEWAc collect template modules.

#### Examples:

```
from IHEWAc collect.templates.util import Extract, Plot, Waitbar, Log
```

```
class IHEWAc collect.templates.util.Extract(file, folder, is_print)
```

Bases: `object`

Extract class

File pre-process, extract.

#### Parameters

- **file** (*str*) – File.
- **folder** (*str*) – Folder.
- **is\_print** (*bool*) – Is to print status message.

### gz()

Extract gz file

This function extract gz file.

#### Parameters

- **file** (*str*) – Name of the file that must be unzipped.
- **outfile** (*str*) – Directory where the unzipped data must be stored.

### tar()

Extract tar file

This function extract tar file.

#### Parameters

- **file** (*str*) – Name of the file that must be unzipped.
- **outfile** (*str*) – Directory where the unzipped data must be stored.

### zip()

Extract zip file

This function extract zip file.

#### Parameters

- **file** (*str*) – Name of the file that must be unzipped.
- **outfile** (*str*) – Directory where the unzipped data must be stored.

```
class IHEWAc collect.templates.util.Log(config, **kwargs)
```

Bases: `object`

Log class

Write message to log file.

**Parameters**

**config** (*dict*) – Is to print status message.

**data** = {}

**write**(*time, msg=""*)

**class** IHEWAc collect.templates.util.**Plot**(*data, file, folder, is\_print, is\_save, is\_show*)

Bases: *object*

Plot class

File post-process, save or show.

**Parameters**

- **data** –
- **file** –
- **folder** –
- **is\_print** (*bool*) – Is to print status message.
- **is\_save** (*bool*) – Is to save files in the folder.
- **is\_show** (*bool*) – Is to show files in the folder.

**class** IHEWAc collect.templates.util.**Waitbar**(*is\_print*)

Bases: *object*

Waitbar class

Waitbar on the cmd window.

**Parameters**

**is\_print** (*bool*) – Is to print status message.

**static wait\_bar**(*i, total, prefix="", suffix="", decimals=1, length=100, fill=""*)

Wait Bar Console

This function will print a waitbar in the console

**Parameters**

- **i** (*int*) – Iteration number.
- **total** (*int*) – Total iterations.
- **prefix** (*str*) – Prefix name of bar.
- **suffix** (*str*) – Suffix name of bar.
- **decimals** (*int*) – Decimal of the wait bar.
- **length** (*int*) – Width of the wait bar.
- **fill** (*str*) – Bar fill.

## Module contents

IHEWAcollect template modules

### 6.8.1.2 Submodules

#### 6.8.1.3 IHEWAcollect.download module

##### Download

Before use this module, create `accounts.yml` file. And edit account information in the file.

```
class IHEWAcollect.download.Download(workspace="", product="", version="", parameter="", resolution="",
                                     variable="",
                                     acct_path='/home/docs/checkouts/readthedocs.org/user_builds/ihewacollect/checkouts',
                                     bbox={}, period={}, nodata=- 9999, is_status=True,
                                     is_save_temp=False, is_save_remote=False, is_save_list=False,
                                     **kwargs)
```

Bases: *User*

Download class

After initialise the class, data downloading will automatically start.

##### Parameters

- **workspace** (*str*) – Directory to `accounts.yml`.
- **product** (*str*) – Product name.
- **version** (*str*) – Version name.
- **parameter** (*str*) – Parameter name.
- **resolution** (*str*) – Resolution name.
- **variable** (*str*) – Variable name.
- **bbox** (*dict*) – Spatial range, {'w':, 's':, 'e':, 'n':}.
- **period** (*dict*) – Time range, {'s':, 'e':}.
- **nodata** (*int*) – -9999.
- **is\_status** (*bool*) – Is to print status message.
- **kwargs** (*dict*) – Other arguments.

**get\_products()** → *dict*

Get details of all products

##### Returns

Products data.

##### Return type

*dict*

**status** = 'Global status.'

#### 6.8.1.4 Module contents

IHEWAc collect: IHE Water Accounting Collect Tools

```
class IHEWAc collect.Download(workspace="", product="", version="", parameter="", resolution="", variable="",
                             acct_path='/home/docs/checkouts/readthedocs.org/user_builds/ihewacollect/checkouts/v0.0.31/doc',
                             bbox={}, period={}, nodata=- 9999, is_status=True, is_save_temp=False,
                             is_save_remote=False, is_save_list=False, **kwargs)
```

Bases: *User*

Download class

After initialise the class, data downloading will automatically start.

##### Parameters

- **workspace** (*str*) – Directory to accounts.yml.
- **product** (*str*) – Product name.
- **version** (*str*) – Version name.
- **parameter** (*str*) – Parameter name.
- **resolution** (*str*) – Resolution name.
- **variable** (*str*) – Variable name.
- **bbox** (*dict*) – Spatial range, {'w':, 's':, 'e':, 'n':}.
- **period** (*dict*) – Time range, {'s':, 'e':}.
- **nodata** (*int*) – -9999.
- **is\_status** (*bool*) – Is to print status message.
- **kwargs** (*dict*) – Other arguments.

**get\_products()** → *dict*

Get details of all products

##### Returns

Products data.

##### Return type

*dict*

**status** = 'Global status.'

## INDICES AND TABLES

- `genindex`
- `modindex`
- `search`





## PYTHON MODULE INDEX

### i

- IHEWAc collect, 42
- IHEWAc collect.base, 34
- IHEWAc collect.base.base, 30
- IHEWAc collect.base.exception, 31
- IHEWAc collect.base.user, 32
- IHEWAc collect.download, 41
- IHEWAc collect.scripts, 35
- IHEWAc collect.scripts.credential, 34
- IHEWAc collect.scripts.main, 34
- IHEWAc collect.scripts.skeleton, 34
- IHEWAc collect.templates, 41
- IHEWAc collect.templates.dtime, 38
- IHEWAc collect.templates.EU, 35
- IHEWAc collect.templates.FAO.WaporAPI, 36
- IHEWAc collect.templates.HydroSHEDS, 36
- IHEWAc collect.templates.IHE, 36
- IHEWAc collect.templates.ISRIC, 37
- IHEWAc collect.templates.MSWEP, 37
- IHEWAc collect.templates.NASA, 37
- IHEWAc collect.templates.NOAA, 37
- IHEWAc collect.templates.USGS, 38
- IHEWAc collect.templates.util, 39
- IHEWAc collect.templates.VITO, 38



## B

Base (class in *IHEWAc collect.base.base*), 30

## C

check\_conf() (*IHEWAc collect.base.base.Base* class method), 30

check\_input() (*IHEWAc collect.base.base.Base* method), 30

conf (*IHEWAc collect.templates.dtime.Dtime* attribute), 38

## D

data (*IHEWAc collect.templates.util.Log* attribute), 40

Download (class in *IHEWAc collect*), 42

Download (class in *IHEWAc collect.download*), 41

Dtime (class in *IHEWAc collect.templates.dtime*), 38

## E

Extract (class in *IHEWAc collect.templates.util*), 39

## F

fib() (in module *IHEWAc collect.scripts.skeleton*), 34

## G

generate\_encrypt() (*IHEWAc collect.base.user.User* method), 33

get\_conf() (*IHEWAc collect.base.base.Base* method), 31

get\_products() (*IHEWAc collect.Download* method), 42

get\_products() (*IHEWAc collect.download.Download* method), 41

get\_status() (*IHEWAc collect.base.base.Base* method), 31

get\_time\_range() (*IHEWAc collect.templates.dtime.Dtime* method), 38

get\_user() (*IHEWAc collect.base.user.User* method), 33

gz() (*IHEWAc collect.templates.util.Extract* method), 39

## I

IHEClassInitError, 31

IHEFileError, 31

IHEKeyError, 32

IHEPassError, 32

IHEStringError, 32

IHETypeError, 32

IHEWAc collect

module, 42

IHEWAc collect.base

module, 34

IHEWAc collect.base.base

module, 30

IHEWAc collect.base.exception

module, 31

IHEWAc collect.base.user

module, 32

IHEWAc collect.download

module, 41

IHEWAc collect.scripts

module, 35

IHEWAc collect.scripts.credential

module, 34

IHEWAc collect.scripts.main

module, 34

IHEWAc collect.scripts.skeleton

module, 34

IHEWAc collect.templates

module, 41

IHEWAc collect.templates.dtime

module, 38

IHEWAc collect.templates.EU

module, 35

IHEWAc collect.templates.FAO.WaporAPI

module, 36

IHEWAc collect.templates.HydroSHEDS

module, 36

IHEWAc collect.templates.IHE

module, 36

IHEWAc collect.templates.ISRIC

module, 37

IHEWAc collect.templates.MSWEP

module, 37

IHEWAc collect.templates.NASA

module, 37

IHEWAc collect.templates.NOAA

module, 37

`IHEWAc collect.templates.USGS`  
module, 38  
`IHEWAc collect.templates.util`  
module, 39  
`IHEWAc collect.templates.VITO`  
module, 38

## L

`Log` (class in `IHEWAc collect.templates.util`), 39

## M

`main()` (in module `IHEWAc collect.scripts.skeleton`), 35  
module  
    `IHEWAc collect`, 42  
    `IHEWAc collect.base`, 34  
    `IHEWAc collect.base.base`, 30  
    `IHEWAc collect.base.exception`, 31  
    `IHEWAc collect.base.user`, 32  
    `IHEWAc collect.download`, 41  
    `IHEWAc collect.scripts`, 35  
    `IHEWAc collect.scripts.credential`, 34  
    `IHEWAc collect.scripts.main`, 34  
    `IHEWAc collect.scripts.skeleton`, 34  
    `IHEWAc collect.templates`, 41  
    `IHEWAc collect.templates.dtime`, 38  
    `IHEWAc collect.templates.EU`, 35  
    `IHEWAc collect.templates.FAO.WaporAPI`, 36  
    `IHEWAc collect.templates.HydroSHEDS`, 36  
    `IHEWAc collect.templates.IHE`, 36  
    `IHEWAc collect.templates.ISRIC`, 37  
    `IHEWAc collect.templates.MSWEP`, 37  
    `IHEWAc collect.templates.NASA`, 37  
    `IHEWAc collect.templates.NOAA`, 37  
    `IHEWAc collect.templates.USGS`, 38  
    `IHEWAc collect.templates.util`, 39  
    `IHEWAc collect.templates.VITO`, 38

## P

`parse_args()` (in module `IHEWAc collect.scripts.skeleton`), 35  
`Plot` (class in `IHEWAc collect.templates.util`), 40

## R

`run()` (in module `IHEWAc collect.scripts.skeleton`), 35

## S

`set_status()` (`IHEWAc collect.base.user.User` method), 34  
`set_status()` (`IHEWAc collect.templates.dtime.Dtime` method), 38  
`setup_logging()` (in module `IHEWAc collect.scripts.skeleton`), 35  
`status` (`IHEWAc collect.base.base.Base` attribute), 31

`status` (`IHEWAc collect.base.user.User` attribute), 34  
`status` (`IHEWAc collect.Download` attribute), 42  
`status` (`IHEWAc collect.download.Download` attribute), 41  
`status` (`IHEWAc collect.templates.dtime.Dtime` attribute), 38

## T

`tar()` (`IHEWAc collect.templates.util.Extract` method), 39

## U

`User` (class in `IHEWAc collect.base.user`), 33

## W

`wait_bar()` (`IHEWAc collect.templates.util.Waitbar` static method), 40  
`Waitbar` (class in `IHEWAc collect.templates.util`), 40  
`write()` (`IHEWAc collect.templates.util.Log` method), 40

## Z

`zip()` (`IHEWAc collect.templates.util.Extract` method), 39