

# What is a persistent identifier

- A PID is a long-lasting reference to a digital resource (document, file, web page, any other object)
- In general they are accesible over the internet
- They should be actionable, i.e. they resolve into a link
- Resulting link should contain machine readable information (content negotiation)
- Examples: ISBN, ISNI, RoR, DOI, ORCID
- Ideally connected to linked open data and semantic web
- Most PIDs (including DOI) nowadays rely on the Handle system: <a href="https://handle.net/">https://handle.net/</a>
- Datacite DOIs like <a href="https://doi.org/10.18160/ATM\_NRT\_CO2\_CH4">https://doi.org/10.18160/ATM\_NRT\_CO2\_CH4</a> also resolve when expressed as <a href="https://hdl.handle.net/10.18160/ATM\_NRT\_CO2\_CH4">https://hdl.handle.net/10.18160/ATM\_NRT\_CO2\_CH4</a>



### Handle

- Non-profit
- Handles are run by <u>Corporation for National Research Initiatives (CNRI)</u>
- You can register a prefix for \$50 per year
- Handles are minted using a simple RESTFUL API
- Log term sustained governance is from the DONA foundation, registered in Switzerland: <a href="https://www.dona.net/">https://www.dona.net/</a>
- You can run your own Handle server in the federated system or rely on providers like ePIC (from EUDAT: <a href="https://eudat.eu/services/userdoc/pids-in-eudat">https://eudat.eu/services/userdoc/pids-in-eudat</a>)
- Software is open software, now v9: <a href="https://handle.net/download\_hnr.html">https://handle.net/download\_hnr.html</a>

You register a suffix and tell the handle system the URL of the resource, that's all

Handle is now extended to DOIP: Digital Object Interface protocol



### **Datacite**

- Non-profit
- Mints persistent identifiers for research
- Directed at citation
- PIDs connect to metadata, currently <u>Datacite Metadata Schema v4.3</u>
- Easy RESTFUL API
- Costs of minting can be covered nationally from ORCID members
- Otherwise:

#### DOI Service Fees for Non-profit Organizations

DOI Service Fees are based on the annual number of repositories and the total number of DOIs created annually. Organizations are charged a base rate of 500€ for 1 repository and 500€ for 10.000 DOIs. Organizations are invoiced the following month for an increase in the number of repositories at a prorated rate. For example, if a Direct Member or a Consortium Organization is currently registering DOIs for one repository and adds an additional repository, thus changing to the range 2-5 repositories, the organization will be charged a pro-rated fee starting at the 1st of the following month. Any overage in the number of DOIs will be billed the following year.

Repositories		DOIs (Digital Object Identifiers)	
Ranges	Annual Fee	Ranges	Annual Fee
0-1	500€	0-10,000	500€
2-5	1,000€	10,001-100,000	2.000€
6-10	3.000€	100,001 and up	3.000€
11-50	6,000€		
50 and up	10,000€		



```
<resource xmlns:xsi="http://datacite.org/schema/kernel-4" xsi:schemaLocation="http://datacite.org/schema/kernel-4 http://schema.datacite.org/meta/kernel-4"</pre>
4.3/metadata.xsd">
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<familyName>Starr</familyName>
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```



## **Collections**

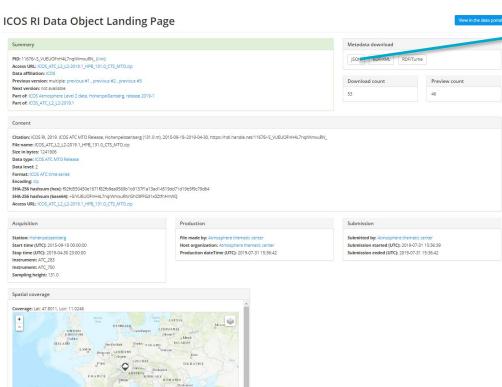
- A collection is simply a resource that consists of a list of PIDs, pointing to resources
- A collection can be linked to from a PID or DOI
- A collection can contain very different resources, for example
  - Collecting a set of collections
  - Collecting data for a station for different periods
  - Collecting data for a station for different measurands
  - Collecting the data for a network of stations
  - Describing a workflow: documentation, input data, scripts, software, instruments, people, resulting data, publication, web resources

#### Advantages

- No duplication of data
- Transparent and citable documentation of workflows: reproducibility
- Linking resources that reside in different places (linked open data assumed)



# Some demonstration

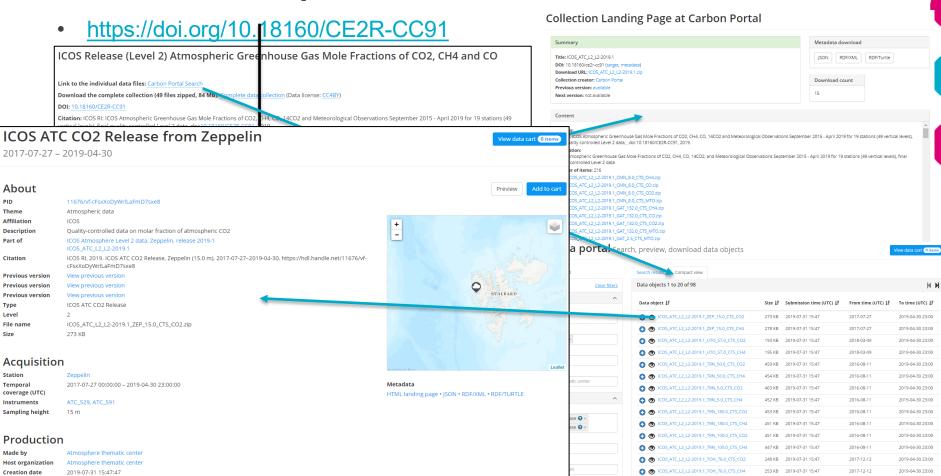


TURKLY M

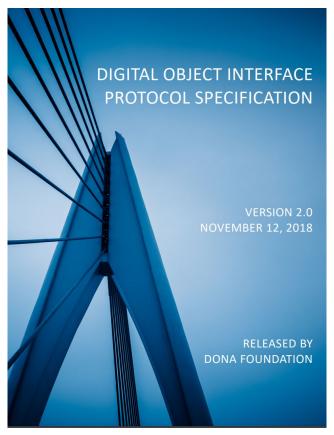
```
"accessUrl": "https://data.icos-cp.eu/objects/-S VUEUOFnH4L7nqlWmxuRN ",
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 ttps://hdl.handle.net/11676/-S VUEUOFnH4L7nglWmxuRN ",
  "coverageGeoJson": "{\n\t\"type\": \"Point\",\n\t\"coordinates\": [11.0246, 47.8011]\n}",
  "fileName": "ICOS_ATC_L2_L2-2019.1_HPB_131.0_CTS_MTO.zip",
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  "parentCollections": [{
    "comments": [],
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        "name": "Atmosphere thematic center",
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```



# The ICOS atmosphere 2019 release collection



#### Short outlook to **DOIP**: generalizing Datacite, Orcid etc



- Fvery DOIP service must properly interpret the following Basic Operations if properly communicated by the client: hello, create, access, update, delete, search, and listOperations. The service may deny or allow a client to perform such an operation depending on the service's internal policies including those that pertain to access control
- The DOIP services may support operations beyond the basic ones; and identifiers of such operations shall be resolvable as specified in the IRP. Those operations are not part of the basic DOIP specification, but the manner in which they are carried out is no different from those of the basic operations.



