DiSSCo

Distributed System of Scientific Collections

Community e-Services

DiSSCo Coordination
and Support Office

About DiSSCo's community e-Services

DiSSCo's e-Services are digital services provided by the DiSSCo RI community to:

- **Support** and improve both physical and digital access for science to the natural scientific collections in Europe;
- **Enable** and support industrial scale digitisation of the collections;
- **Provide** enhanced interpretation, curation, annotation and use of rich specimen information by novel mechanisms for community curation, visualisation and (re-)connecting with genomic, chemical, geographical, morphological, taxonomic and environmental information.

Through the e-Services DiSSCo will provide a unique access point for integrated data analysis and interpretation.

The e-Services are developed based on user stories and prioritization provided by collection providers and the scientific community to serve real user needs. DiSSCo aims to become operational around 2025 but some of the services are already under development.

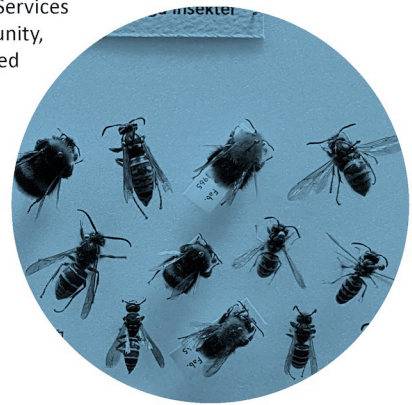
What DiSSCo's e-Services will bring

For natural science collections providers they will help providers to become an integral part of the European and Global scientific community, to adapt to changing user needs and advance scientific usage, they will help providers receive appropriate acknowledgement for the value of natural collections and they will reduce digitisation costs and bring new opportunities for funding.

For researchers the services will improve efficiency to become more responsive to urgent needs, they will accelerate biodiversity discovery, will improve visibility in your contributions to FAIR and high quality data and will reduce the global carbon footprint.

What it will take to participate in DiSSCo's e-Services

The e-Services are being designed with focus on real user needs, including the needs of collection providers. This also means that they are designed in such a way that they require minimal changes in how the collections are maintained and that they include solutions both for very small and very large collection providers to become part of the e-Services. DiSSCo's e-Services are provided by DiSSCo partners for DiSSCo partners and the wider community, and a structure of National Nodes will help in providing customised guidance, support and training.



The e-Services cannot be established without efforts from the collection providers though. At a minimum it requires staff to provide and maintain descriptions about the collection holdings and facilities. Other efforts may be transferred to the National Node: Access to the collections requires staff supporting e-Services users in requests for visits, loans and digitisation on demand. Access to data may require to provide access authorisation to data that has legal restrictions. Usage of the e-Services in digitisation and data provision will require digital transformation to make use of trusted data repositories and connect with infrastructure for Digital Extended Specimens.

Planned e-Services and their development status

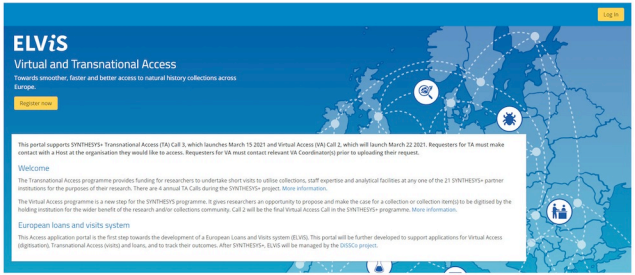
DiSSCo's e-Services will bring about change in the way technology, processes and people interact. A true digital transformation of Natural Science Collections. To indicate the status of development we use Technical Readiness Levels (TRL).

· European Loans and Visits System (ELViS)

Service URL https://elvis.dissco.eu (hosted by Naturalis and Picturae)

Version information Version 1 developed in the SYNTHESYS+ project, to be released March 2021 with support for Transnational Access (TA) and Virtual Access (VA, digitisation on demand) requests. Version 2 to be released medio 2022 with support for Loans.

TRL status 7-8. Operational with a limited number of collection providers, in use for TA and VA through SYNTHESYS+ calls.

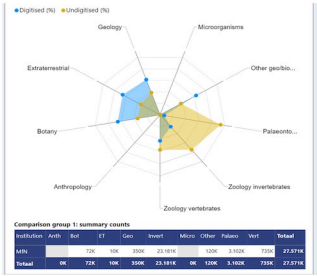


Description ELViS is a one-stop shop for access to the collections in Europe. It provides a unified way to request visits, loans and virtual access. Virtual access requests through ELVIs provide digitisation on demand as a new type of access, including support for collaborating on VA ideas and proposal submission. The request mechanism implemented in ELViS also enables future services for tracking usage metrics, monitoring and reporting and connecting collection usage with research outputs.

· Collections Digitisation Dashboard (CDD)

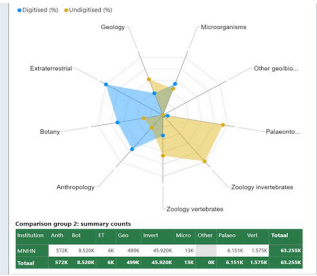
Service URL https://rebrand.ly/synth-cdd (Hosted by NHM)

Version information Prototype was developed in the SYNTHESYS+ project and released in 2020 with standardised collection information from a limited number of institutions. Further development is planned for 2021/2022 to automate the data import and allow for more institutions to join, to create a pipeline for data updates through the CETAF registry and to become compliant with the TDWG Collections Descriptions standard under development.



Comparison group 1: summary counts

Institution	Anth	Bot	ET	Geo	Invert	Micro	Other	Palaeo	Vert	Totaal
MIN			72K	10K	350K	23.181K		120K	3.102K	735K	27.571K
Totaal		0K	72K	10K	350K	23.181K	0K	120K	3.102K	735K	27.571K



Comparison group 2: summary counts

Institution	Anth	Bot	ET	Geo	Invert	Micro	Other	Palaeo	Vert	Totaal
MNHN	572K	8.520K	6K	499K	45.920K	13K		6.151K	1.575K	63.255K
Totaal	572K	8.520K	6K	499K	45.920K	13K	0K	6.151K	1.575K	63.255K

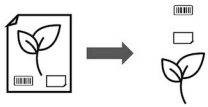
TRL status 6. Working prototype with a few collection providers.

Description The interactive dashboard visually summarises the digitisation status, content and strengths of collections across the community of institutions through a number of visual elements. It displays progress in digitisation and provides summaries and comparisons of the number of objects, taxonomic scope, categories of preservation, stratigraphic age, geospatial range, level of digitisation and digital content availability for reuse. The dashboards implements a novel specification for standardised collection descriptions to enable cross-institutional aggregation and comparison of data.

· Specimen Data Refinery (SDR)

Service URL Not yet available.
More information: https://doi.org/10.3897/rio.6.e57602

Allow curators & researchers to create and run repeatable and citable workflows resulting in datasets with rich self-descriptive metadata based on GUIDs and persistent identifiers



Segment and crop parts of images

Group similar specimens and labels
(based on size, shape, colour, landmarks)

Measure specimens and labels

Georeference text

Version information Specimen Data Refinery (SDR) services are defined and prototyped in the SYNTHESYS+ project. These may use DiSSCo infrastructure for Digital Specimens and their images to be defined and demonstrated in the DiSSCo Prepare project.

TRL status 3. Concept formulated and experimental proof of concepts in place.

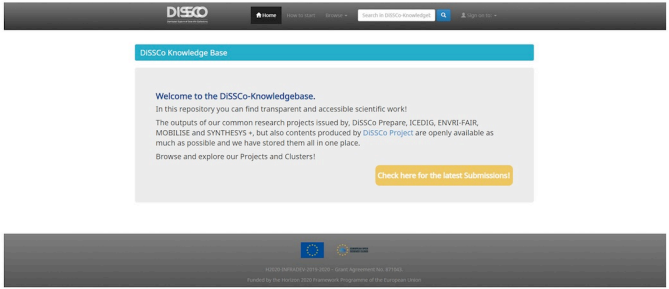
Description SDR will support transformation from digitization workflows processing individual specimens and their metadata one-by-one to industrial scale digitisation by providing a platform that integrates artificial intelligence and human-in-the-loop approaches to extract, enhance and annotate data at scale from digital specimen images and records. When connected with Digital Extended Specimen infrastructure, awide range of potential applications could be developed by third party providers such as automated condition checking of specimens, natural language descriptions provision for specimens and taxonomic trait extraction.

· Knowledgebase

Service URL https://know.dissco.eu (hosted by MfN)
More information about the Knowledge Base on DiSSCo.tech.

Version information A beta version will be available through a soft launch in March 2021.

TRL status 6. Prototype created in DSpace 6 as beta, a more complete implementation will follow in DSpace 7 which offers improved integration with e.g. ORCID iDs.



Description The Knowledge Base provides a central search and browse interface to find all documentation related to DiSSCo. These include research outputs created in DiSSCo linked projects (DiSSCo Prepare, ICEDIG, ENVRI-FAIR, MOBILISE and SYNTHESYS +) but also other contents: training materials, Frequently Asked Questions (FAQs), best practices, guidelines, recommendations, technical documentation and documented decisions. The Knowledge Base is implemented with DSpace, which includes a hierarchical structure for the documents, full text search, a REST API, custom metadata, versioned documents, DOIs. The service will be integrated with other DiSSCo services that require linkage to documentation such as the helpdesk. Schema.org metadata inclusion will ensure findability in search engines like Google.

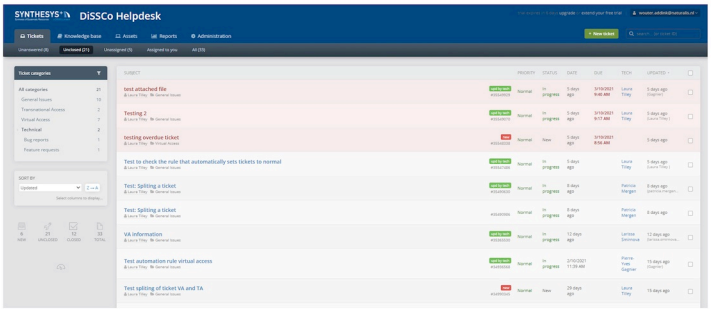
· Helpdesk

Service URL https://dissco.jitbit.com/helpdesk (hosted by CETAF and Naturalis)

Version information The system is used for testing in 2021 and will be used in production with ELViS from 2022.

TRL status 7. Helpdesk has been set up and tested but is not in production yet.

Description The DiSSCo Helpdesk will be a central place for all questions related to DiSSCo eServices or access programmes such as the virtual access and transnational access calls in ELViS. It will be integrated with DiSSCo e-Services, starting with ELViS in 2022. The Helpdesk is using JitBit software. First line support is done by CETAF secretariat while second line support goes to selected CETAF/DiSSCo institutions (starting with SYNTHESYS+ NA2 partners). Third line support goes to developers of e-Services such as Picturae for ELViS.



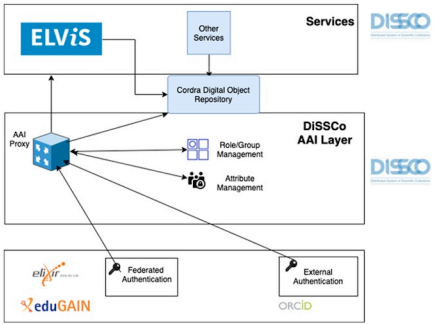
· Authorisation and Authentication Infrastructure (AAI)

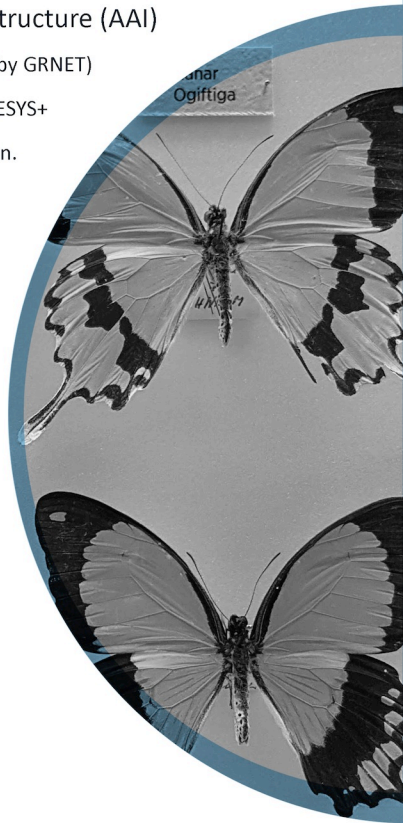
Service URL https://synthesys.aai-dev.grnet.gr/auth/ (demo, hosted by GRNET)

Version information The system is implemented as pilot in SYNTHESYS+

TRL status 4 initial demonstrator created for experimentation.

Description Infrastructure will be created to be used by e-Services that require authentication (identification of a user) or authorisation (level of access for a user). Users can authenticate themselves through their institutional accounts, if the institution is connected to eduGAIN. If their institution does not yet offer this, the user can authenticate themselves through login with ORCID iD or social media credentials (single sign-on). Institutions will be able to give selected users of eServices authorization to access data that has legal restrictions, such as sensitive data on rare species. For verification of users the system will experiment with ORCID profiles augmented with extra data about expertise and affiliation.





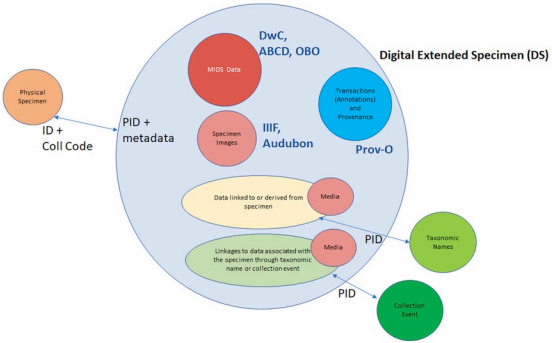
· Unified Curation and Annotation System (UCAS)

Service URL -

Version information -

TRL status 1 Basic principles are being discussed.

Description Specimen data will be made available as Digital Extended Specimens (DS) digital twins from the physical objects connected with data derived from the specimen such as sequences, morphological data or taxonomic traits) and connected with data through the gathering event or taxonomic identification. The DS will include both authoritative data sections (supplied by the collection provider) and non-authoritative data sections. UCAS will provide event-based curation and annotation functions on the DS for experts in the community and for machines. Transactions on the data will be stored as well as provenance information related to the curation or annotation events.



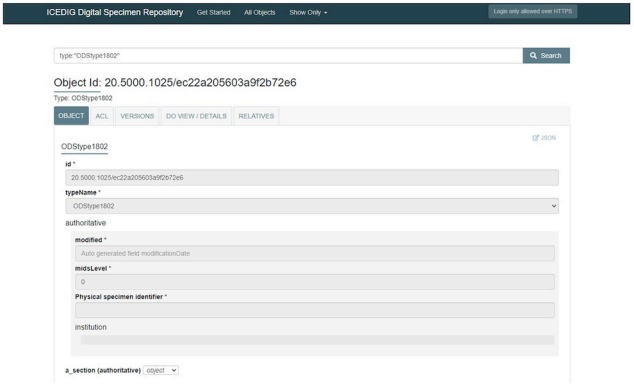
· Digital Specimen Repository (NSIDR.ORG)

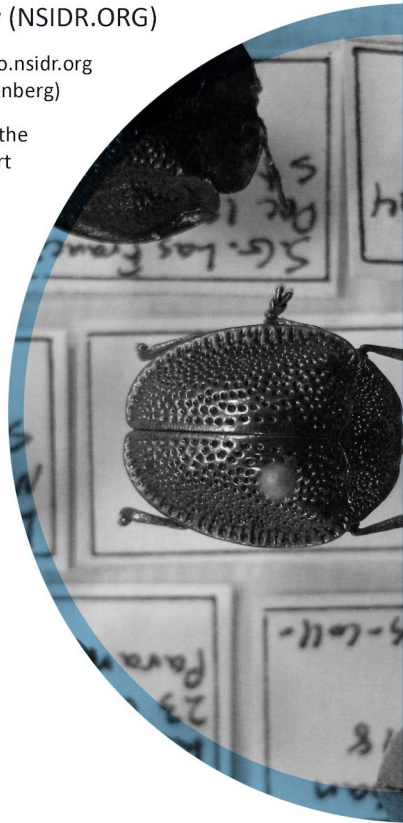
Service URL nsidr.org & demo.nsidr.org
(hosted by Cardiff University, Naturalis, Senckenberg)

Version information Demonstrator, developed in the ICEDIG project to test the Digital Specimen concept. Will be further developed into a pilot to support development of the Open Digital Specimen specification.

TRL status 3 Experimental proof of concept

Description NSIDR.org is a metadata repository for experimentation with Digital Extended Specimen and other DiSSCo-related FAIR Digital Objects. It uses Cordra (see: cordra.org) to manage the digital objects and resolvable identifiers (Handles, DOI).





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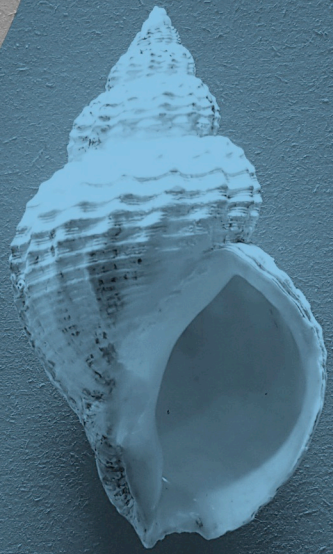

Pelikanfotsnäcka

Aporrhais pespelecani

Lever på mjukbotten.
Samlar mat med hjälp av
förlängd skalmynning.

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