Minutes of the joint CETAF Digitisation Group and ISTC Virtual Meeting, 26 April 2021

Executive Summary

The meeting originally planned for London took place in the form of a shorter teleconference on 26 April 2021 due to the corona situation. The agenda is publicly available at https://cetafdigitization.biowikifarm.net/cdig/ISTC_DWG_Meeting_Spring_2021. Presentations as well as these minutes will be made available on the same website. The meeting was attended by 38 participants from 16 CETAF member institutions, the CETAF secretariat, and DiSSCo.

Action Items

- To organise a DiSSCo “micro-changes” meeting before the summer break (A. Güntsch, ISTC).
- To assess and support proposed DwC changes (W. Addink, ISTC).
- To make a recommendation that IIIF should be adopted if renewing/installing image management infrastructure (ISTC, CETAF).

Participants

Anton Güntsch (BGBM), Elspeth Haston (RBGE), Peter Grobe (ZFMK), Patricia Mergen (Meise & RMCA), Frederik Leliaert (Meise). Alex Hardisty (U Cardiff), Dagmar Triebel (SNSB), Stefan Seifert (SNSB), Anne Koivunen (Helsinki), Karol Marhold (Bratislava), Quentin Groom (Meise), Vince Smith (NHM), Pieter Huybrechts (Meise), Mathias Dillen (Meise), Pierre-Yves Gagnie (MNHN), Thierry Bourgoin (MNHN), Ana Casino (CETAF), Josh Humphries (NHM), Christian Bräuchler (Vienna), Celia Santos (Madrid), Eirik Rindal (Oslo), Claus Weiland (Senckenberg), Björn Quast (ZFMK), Birgit Klasen (ZFMK), Laurence Livermore (London), Franck Theeten (RMCA), Heimo Rainer (Vienna), Wouter Addink (Naturalis), Sharif Islam (Naturalis), Maarten Trekels (Meise), Matt Woodburn (NHM), Dominik Röpert (BGBM), Myriam van Walsum (Naturalis), Roger Hyam (RBGE), Mareike Petersen (MfN), Frederik Berger (MfN), Régine Vignes Lebbe (MNHN), Wesley Tack (Meise)

ISTC Meeting

Adoption of Agenda

The agenda was approved.

Project updates

GeoCASe 2.0 – The Earth Science Collections Portal

Falko Glöckner presented the new version of the GeoCASe portal which was launched in January 2021 ((https://geocase.eu/). The GeoCASe advisory board has been formed to steer future activities. The API is in development mode. Phase 1 was to replace the portal, which has been acieved. Phase 2 now (2021) focuses on data quality (harmonization, enrichment, increasing the amount of data, machine readability and data linking). Harmonization and increasing data needs support of CETAF institutions. Phase 3 (2022) is about planning integration into the DiSSCo RI.
Disscussion:
There is an initiative for the implementation of a module for adding geological data to SPECIFY. A connection to GeoCASe should be explored. A module is being added to Specify for purely geological data, they are interested in Geocase and are inviting anyone using Specify to get involved and support getting this implemented.
Vince Smith: how does GeoCASe deal with data citation? We really do need info about how data is used once it has been provided to the aggregator. How does GeoCASe support that?
Falko Glöckner: -there is a download function, and a conversation ongoing about how to do that. Citation aspect and identifiers discussion needs to take place in DiSSCo context.

Botany Pilot

Anton Güntsch presented the implementation of the CETAF Botany Pilot, which was successfully completed. The aim has been to demonstrate principles of semantic annotation of collection data and assess feasibility.
Collections are using a range of standards to represent collection data, with well-defined terms, but poorly defined concepts; often using free text where different things have the same representation and the same things have different representation. This is not good for machine usability.
~1.4million specimens have been annotated in the pilot so far. With these annotations dynamic web pages can be generated that present together data from several sources - wikidata, specimens, bionomia, etc.
Next steps: now shifting attention from persons to geographical annotations. See next agenda item also.

Semantic annotation of locality data …

… in Meise

Mathias Dillen presented the works on geographic annotation of collection data in Meise using Geonames, Getty, and Wikidata IDs. Compared to coordinates these identifiers can help with additional validation of location.

Making geographic coordinates interoperable is more difficult as it seems, due to things like georeferencing errors and unknown coordinate reference systems. Let alone that locations (geographical features) are more complicated as simple points, but also include line features and polygons. Using identifiers allows semantic linking, persistent and unique identifying, and allows for validation and delegation. In short, turning strings into things.

Meise attempted to connect locality strings to Geonames PIDs. 500k+ unique strings from MeiseBG herbarium specimens, most with a known ISO country code. 3 steps: i) split locality strings by common delimiters ii) strip out non-alphabetics iii) match per ISO cc. Then exclude uncertain or ambiguous matches.

Result: 16% connected to a single geoname id. 36% matched to multiple geonames ids.

Questions:

- How to publish? Use `dwciri:inDescribedPlace` to publish the pids? But isn't really a solution at the moment.
- How to publish? How to do it in DarwinCore Archives (GBIF), how to model more than a single locality, but the whole hierarchy?

… at BGBM

Dominik Röpert presented similar acitivities for geographic annotation at the BGBM based on 400k free-text entries about location, German, English and other languages, which are spread across 3 columns in the collection database:

- Clustering and merging strings: Using key collision with a cologne-phonetic keying function, clustering strings to a single value based on a German bias Soundex like phonetic engine (based on the pronunciation of the string).
- The BGBM uses openRefine filtering and faceting capabilities to achieve one annotation per record. Duplicated columns to allow comparison of original and edited versions of the data. Pull Geoname ids and compare the distance of that place with original coordinates if available to check if close enough.

Conclusion: At the moment, many of these activities are still experimental and would welcome further contributions. They can be very valuable in DiSSCo context and discussions should take place now about how these kinds of activities can be turned into robust DiSSCo workflows.

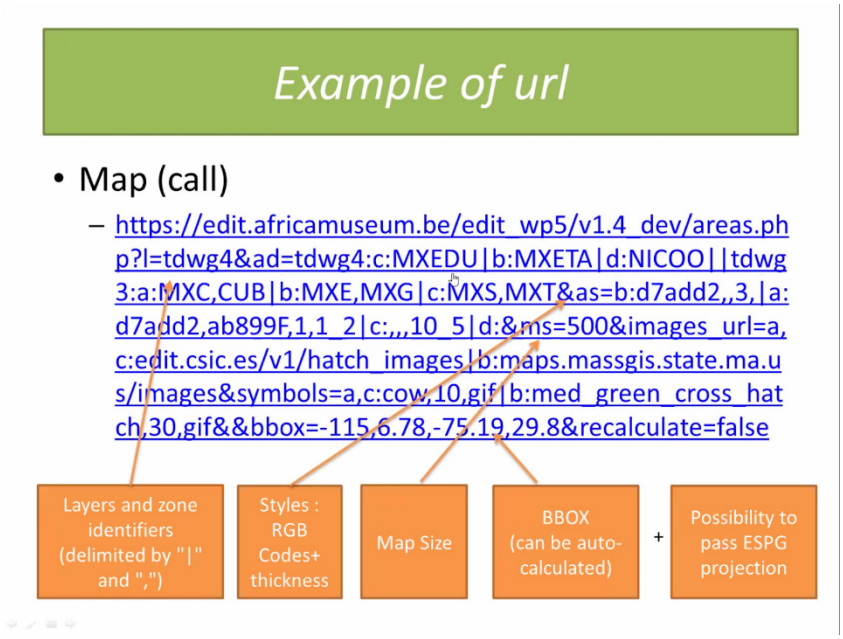
Dynamic map generation as a service

Frank Theeten presented the new generation of OGC-WMS based dynamic map generation services implemented at RMCA (Tervuren). The services are already used by several biodiversity portals such as

- EuroPlusMed (BGBM)
- Flora of Cyprus (BGBM)

- Hemiptera Databases (Paris)

Example service call:



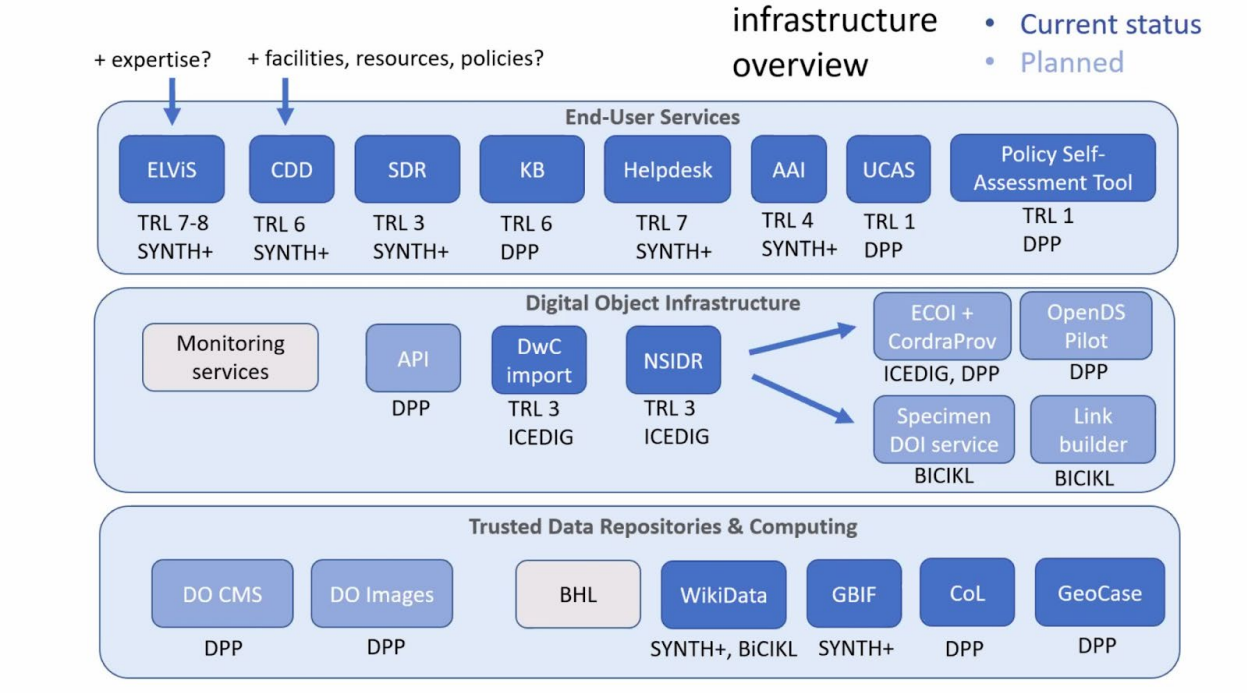
Questions:

- Peter Grobe: Why don't you use json for querying the service instead of a long, error-prone uri? It would be good to have an API in front to make it more programmer friendly.
- Anton: Can CETAF partners just use the services? Or is some agreement needed? Is there documentation/website?

Frank Theeten: The services are quite robust but might need to be modified a bit. Links to details and documentation are included in the presentation.

Integration with DiSSCo: What are reasonable first steps?

Wouter Addink gave a presentation including a DiSSCo infrastructure overview and potential co-operation with the ISTC. An infrastructure overview diagram shows trusted data repositories and computing at bottom, DO infrastructure in middle and end-user services on top:



We can separate between steps that can be taken by ISTC and steps that can be taken by institutions themselves.

- Timeline - several pilots becoming available late 2021/early 2022 - therefore what steps to become more integrated?
- Several sources of info: elvis.dissco.eu, know.dissco.eu, dissco.tech/labs, nsidr.org, github.com/DiSSCo.
- Identifying institutional technical and administrative contacts to work with to move towards readiness, with an overall integrated implementation plan that will be dynamically implemented by 'enablement teams'. By end of 2021 would like to have some micro-changes completed by all the institutions - small things that don't need a lot of time or technical knowledge to implement which together can improve the overall situation.
- Several roles for ISTC proposed:
    - Support for changes at international level
    - Advise developers and create consensus on implementation
    - Training workshops

First issue (see Wouters slides for details): Darwin Core - is an occurrences model, not a specimen model. Makes mapping of collection records to DwC problematic. materialSampleId seems a better fit for specimen identifiers than occurrenceId but not being widely used at present. The ISTC will consider the proposed changes and give support towards a 2022 update.
Second issue (see Wouters slides for details): 'What is it' description of specimens - what does it represent, what is it made of, how does it look like/how is it mounted/prepared, how is it preserved. New terms are needed to clear up what has until now been an area of big confusion. Needs unambiguous terms with no overlap and agreed lists of controlled values. ISTC could create a recommendation of the terms to be used, following TDWG CD and MIDS.
Third issue: What information does an institution need about a requester to give access to restricted data?

Micro-changes to implement by the end of this year. ISTC should prepare these during the summer:

- Institutional identifiers. ROR.
- Harmonize institution and collection identifiers in GBIF.
- Identify datasets in GBIF and GeoCASe by checking a prepared list.
- Identify collection catalogue datasets not yet shared
- Link data providers to institutional identifiers and add to IPT metadata
- Provide CETAF register data

Discussion:

- Vince Smith: Very good. A series of very detailed proposals. Very busy teams. How to respond? Are we missing a level of communication to/with the teams responsible for implementation?
- Wouter Addink: This is why we need to identify the enablement teams in the institution, which is the first step we are now taking to solve this.
- Quentin Groom: Very nice to see how far we've come. About what the ISTC can do, there are many institutions that don't have an IT team. How can they be helped to implement some of those changes?
- Wouter Addink: Many of the first steps should be very easy and not technical but beyond that the national nodes have a significant role to play. At the same time we need to build capacity. A mixed model in DiSSCo catering for a spectrum of competencies/capacities.
- Anton Güntsch: Wouter touched so many issues and points. Remaining time is not sufficient to discuss/decide. In general, there are too many issues for a committee like ISTC to tackle in a proper way. In particular, should rely on existing (TDWG) bodies where we can for standards issues. For the micro-actions, ISTC can support the institutions. It's a very practical thing. A workshop on this before summer is possible/promising.
- Wouter Addink: Agree. If it's possible though for ISTC to take a position and strongly support beneficial proposals to eg TDWG that would help. Also to recommend from the standards work results how the CETAF community can best exploit.
- Roger Hyam: Success of DwC adoption has been the instant payoff of getting data into GBIF and a dot on the map. We do need to think of the longer-term but have to come up with small changes that have immediate impact; otherwise difficult to get people to implement. Can we explain as 'if you do this, you'll get this benefit next week …'
- Wouter. Good suggestion.

Conclusions:

- Wouter Addink will send the list of proposed DwC changes to the ISTC mailing list and ask for support.
- ISTC/DiSSCo will try to organise a "micro-changes" workshop before the summer break.

IIIF: from experiment to infrastructure

Roger Hyam gave a presentation on IIIf implementations in European institutions. Much of the work has been achieved under the umbrella of SYNTHESYS+ (task 4.3). So far, 10 institutions have exemplar implementations, 4 deployments are nearly live. A report will be submitted by end of April.
Next step: demo applications. See https://www.herbariamundi.org/. Roger will continue as "IIIF Ambassador".

DiSSCo integration: Trivial inclusion of IIIF end points for specimen images. Not so trivial provision of infrastructure for hosting image files.

Discussion:

- DiSSCo integration. Two immediate discussion points: i) IIIF end points for specimen images ii) provision for hosting image files. Other possibilities include thematic portals, common annotation mechanisms (W3C based), machine learning for label segmentation at a minimum.

Conclusion:

- We should make a recommendation that IIIF should be adopted if renewing/installing image management infrastructure.

AOM, next meetings

The participants hope that the next meeting can again take place as a physical meeting. This would then take place in spring 2021 at the NHM in London.

Digitisation Working Group

Adoption of Agenda

The agenda was approved.

DWG update

Minimal Information about a Digital Specimen (MIDS) standard

Elspeth Haston and Alex Hardisty presented an update on the work done by the DWG during the monthly meetings to assess the development of the MIDS standard from an implementation point of view.

- Cooperation with TDWG MIDS group. MIDS work on GitHub: https://github.com/tdwg/mids. If you like to join the TDWG TG MIDS mailing list: http://lists.tdwg.org/mailman/listinfo/tdwg-mids.
- Work of DWG is focused on implementation and practicality whereas TG focus is on writing and agreeing the specification. Summary of DWG meetings on biowikifarm: https://cetafdigitization.biowikifarm.net/cdig/DWG_Meetings_2020-21.
- Started working on MIDS-1 and -2 elements. Some big and fundamental questions becoming apparent, which have been disconcerting for many people for a long time.
- Original concept was of some basic DwC/ABCD terms that could be adopted into a specification. Was probably an over-simplification. Has become clear that MIDS Info Elements are probably something in themselves that could be mapped to e.g., DwC and ABCD/EFG. Close relation also to CD.

- How to move forwards practically? That involves a more focussed implementation kind of discussion, involving different kinds of collections. That can lead to more detailed mapping of terms. Aim to work through by MIDS-1 by September.

Discussion

- Quentin: Getting implementations working is key. Also a need to recognise the urgency of it. Better to have a working solution sooner rather than later waiting for a perfect and complete solution.
- Anton: Agree. Do you have a clear vision of what an implementation of MIDS in an implementation would look like? Do you have a vision of scenarios?
- Elspeth: Several key use cases: i) a reporting tool so institutions, organizations can report on level of dign; ii) providing guidance on planning and prioritisation of data capture; and guidance on mapping to various fields in GBIF iii) using the outcomes of digitization.
- Anton: Most obvious use is to write a piece of software that checks digitized data records against MIDS compliance. Such a tool could be implemented and maintained in parallel with standards development. Is very interesting.
- Dagmar: The mappings to DwC/ABCD would be very useful because we have software that guides mappings. If we treat MIDS elements as a core thing then we could have transformation back again as an institutional check that everything has been included in their DwC/ABCD mapping of what is published.
- Mathias: Last November I tried to make a tool that tries to estimate MIDS levels in GBIF as it was then. Could be improved and built on. Can also do at collection level too but is more tricky as data models vary. https://github.com/tdwg/mids/issues/2
- Elspeth: If calculating MIDS, must be clear about the context of that calculation. Must state it.
- Data has to be available publicly. This is a requirement of MIDS conformance.
- Alex: Implementations are critically important for successful specification works. Preferably multiple implementations to be able to compare.
- Quentin: Why would it be interesting, for a specific specimen, to see an indicator of what MIDS level it was at?
- Elspeth: A more natural way to select is on the availability of e.g., lat/lon coordinates. But could use as a driver of digitisation.
- Quentin: ‘This is the improvement we got by running this workflow’. Eg in SDR context.
- Mareike +1, also when explaining to funding bodies.
- Vince: A lot of this about internal organisation. A good way of explaining how far we’ve got with mass digitisation. Less useful to individual researchers but helps to explain ‘levels of digitisation’. Shouldn’t overstretch what we can achieve with MIDS.
- Elspeth: The need for guidance, so institutes know what and how to map. Emphasises need to move forward with implementations quickly. DWG will focus on for coming months. Work of Mathias, for example. In a smaller group too. Aim towards a baseline calculation for the CETAF digitization target.

Conclusions

Next step for the DWG’s work on MIDS is to undertake focussed implementation by institutes who are able to participate in this. This focussed implementation to start with: i) a reporting tool so institutions, organizations can report on level of digitisation; ii) providing guidance on planning and prioritisation of data capture; and guidance on mapping to various fields in GBIF. The third use case that was identified, iii) using the outcomes of digitization, may be included as a slightly later implementation.

CETAF Registry

Franck Theeten and Ana Casino presented an update on the development of the new CETAF Registry which will replace the CETAF passports. This will also form part of the DiSSCo framework and will therefore include data for non CETAF institutes.

- CMS describing metadata and contact info for CETAF (and other) institutes
- Using json api
- Demo of website: http://collections.naturalsciences.be/cpb
- Data brought in from previous CETAF website and CETAF passports
- Developed an ISO identifier for the institutes ISI country code + collection code (institute acronym)
- Hierarchical data organisation
- Collection categories (11 so far) - still open for discussion
- Potential to include a MIDS level + average computation
- Possible to registers Facilities, Institution metadata (including staff), Research activities for institutes
- Zope/Plone system
- Data exposed to HTTP REST API
- Linkage with controlled vocabularies
    - Collection classification
    - JACS3
    - TDWG
    - DWC
- ElasticSearch for GeoCASE
- Identifiers
    - GRID (institutes)
    - Wikidata (institutes)
    - SrSCiColl (collections)
    - ORCID (people)
- New website with CETAF Registry will be presented at the CETAF meeting in May
    - data will be updated over the summer

Discussion

- Anton: How optimistic are you that institutes will maintain their data in the CETAF Registry given difficulties in gathering passport data
    - In the new system, people in institutes will be able to update the data themselves.
    - CETAF don't have the capacity to oversee all the institutional data themselves
    - Hopefully it will be much easier
- Vince: applauds the ambition, but the learning so far suggests that the process needs to be automated as much as possible and linked to benefits. New version will make it harder. Worried that it will be realistic to get data in the timeline for them to make sense.
    - Ana: Data being requested not different to those kept by collections. There is a risk, but no new data being requested.
    - Wouter: plan is still for ELViS to use the CETAF Registry as long as time and budget allow.
    - Ana: CETAF Registry will also be open to non CETAF institutes, eg for DiSSCo. Moving to a web-based solution to aggregate the data and serve for more needs as they come in.

Open Digital Specimen (OpenDS)

Alex Hardisty presented an update on the development of the OpenDS standard.

- Link to global consultation: https://discourse.gbif.org/t/converging-digital-specimens-and-extended-specimens-towards-a-global-specification-for-data-integration/2394
- http://bit.ly/consultdes
- Digital object acting as a twin to the physical object
- To be fully compatible with the framework of the EOSC
- In parallel to the work in the US on the Extended Specimen Network (ESN)
- An initiative in the US is very similar to that of DiSSCo
- Discussions through the year have led to a Global Consultation (link above) to look at converging these ideas
- Looked at 5 topics in Phase 1
- Phase 2 starting in May/June
    - Invitation to contribute if you have expertise and/or opinions
    - Moderators needed for a) legal/regulatory, ethical and sensitive data obligations, b) workforce capacity development and inclusivity
    - contact Alex or Wouter
- Summaries of consultations available on the website
- Strong consensus and complementarity being found
- Data levels and Interactions visualisation between the physical specimen and the aggregators/ end users and interactions in the cloud.
- Standard for an Open Digital Specimen to enable exchange and interoperability between computer systems, to enable remote operations and both machine and human processing.
- Series of questions/answers on http://bit.ly/opendsfaq
- GitHub link here: https://github.com/DiSSCo/openDS
- OpenDS data model been outlined, in relation to DWC, ABCD/EFT, RDA, Recording attribution metadata, W3C PROV, OBO Foundry ontologies, heritage sector standards
- First JSON schemas appearing
- Invite more contributors
- Aim to have two running implementations to interoperate with each other

Discussion

- Vince: good to make slides available
- Alex: nsi.org demonstrator to show implementation. Could build up a demo of how users could work with curating specimens remotely with annotations. Concept of round tripping was a big topic in discussions.
- Quentin: Demonstrating the power of the linkages between different data types. Would be good to find good examples of specimens that have really good links
- Alex: difficult to find comprehensive examples of specimens with derived data. Many in many of the standard places: literature, genbank, etc. More difficult to find them in other 3rd party resources, eg Red Lists etc. About 2 years ago a piece of work on Red Listing of trees took occurrence data from GBIF as estimates of conservation status. Many would have been specimens, but linked data not necessarily available.

Specimen Data Refinery (SDR)

Laurence Livermore presented an update on the Specimen Data Refinery which is being developed within SYNTHESYS+ JRA 3 workpackage.

- About 85% of specimen information is currently only on specimen labels or physical registers and not digitally available.
- Most digitisation is currently manual and constrained by cost of staff.
- The SDR aims to develop a cloud-based platform of tools with a list of key workflow tools
    - Workflows could process images and data to include segmentation, object detection, colour, text analysis, etc.
- Currently completed landscape evaluation, now developing tools and workflows to produce a demonstrator.
    - Landscape analysis with 76 tools and services, which were rated by achievability and use of NH data, technology stack for developing a computational workflow.
    - A Minimal Viable Produce (MVP) demonstrator platform will be developed by July 2021, and further development will continue until end of project.
    - Agreeing the scope of the MVP: https://docs.google.com/document/d/1sNclNbnMJrIVWeV1-9Rikd3SUX00T2x3L5-Lwqcyx6A/edit
        - Scope: herbarium sheets, pinned insects, microscope slides
        - Functional requirements
        - OpenDS will be the exchange format
        - Provenance of modifications will be tracked
        - JSON/JSON-LD will be used to store image regions of interest and text
- Users are either digitisers or collection managers/curators
- Training and ground truthing datasets.
- Some of the discussion today fit the SDR framework.
- Paul Brack from UNIMAN (University of Manchester) joined the project.
- Current work:
    - Developing example Galaxy pipeline/workflow (due May)
    - Moving to DiSSCo SDR GitHub as issues (due May)
    - Scheduled trial of DiSSCo image repo for staging
    - Discussing standards
        - FAIR Digital Objects
        - Provenance
        - Results from OCT/HTR/NER (https://teklia.com/blog/2021-export-formats/)
        - Need datasets
    - Recruiting for an 18 month computer vision PDRA (based at NHMUK) - please get in touch with Laurence if you know someone who may be interested.
- Regular fortnightly meetings which are open to interested people who are working in this area.
    - Contact Laurence for more details

Discussion

- Vince: Challenge of finding the people with the right skills for the work they're wanting to do.
- Quentin: Additional challenge of collaboration and often people work on their own. Would be better if they can maintain contact with other people working in this area. Can be isolated within an institute.

- Laurence: Contact with computer science labs already, eg bumble bees. Interest in this sector will be critical since they would get other jobs easily with more money.
- Claus: Would a postdoc be necessary. In our area they would be solving tomorrow's problems with yesterday's techniques. Can we hire someone who could do a PhD through the work? An opportunity to get a good person but would need a longer project? Possible to set up a discussion on this at the fortnightly meetings? Could look at building a discussion network for these people.
- Quentin: we do have some really interesting problems that a lot of developers/informaticians/computer vision people are not aware of.
- Vince: Our set of needs are not that complicated but having a person who is familiar with techniques and what's going on in AI is maybe what we want; not necessarily a technique research leader. Someone to take/exploit existing technical approaches.
- Anton: Fraunhofer in Germany has a strong focus on domain and industrial applications of technology and could be a potential partner. www.fraunhofer.de
- Patricia: In Belgium check : https://www.imec-int.com/en IMEC

Next steps for the Digitisation Working Group

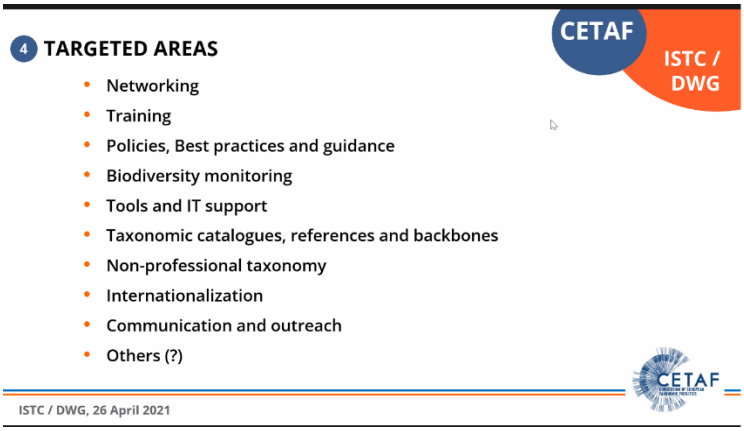
Elspeth Haston presented the next steps for the DWG, being primarily to continue with the development of the MIDS Specification and Standard, continuing with the focus on implementation.

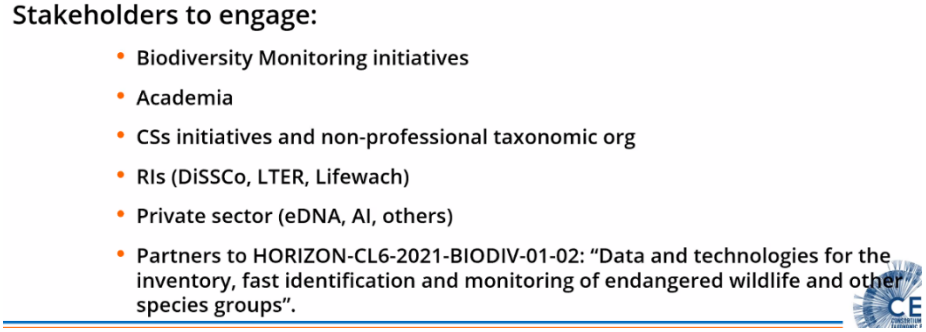
- Elspeth Haston informed the DWG that she would be stepping back from chairing the DWG and invites volunteers or suggestions for someone to take over the role.
    - Additional comment from Elspeth: "This has been an excellent experience over the years and has allowed me to meet colleagues across Europe and beyond. This also gave me the opportunity to build a network of friends – incredibly positive people who are excited and passionate about both the reasons for digitising our collections as well as the processes and technologies of doing it. I would therefore encourage people to consider taking on this role and also seeing as a chance to bring your own ideas of what this amazing group of people can achieve together."
- Ana expressed how very grateful she and CETAF is for the hard work Elspeth has done to stir up and lead the WG forward.

CETAF proposal for the Horizon Europe call on developing taxonomic capacity

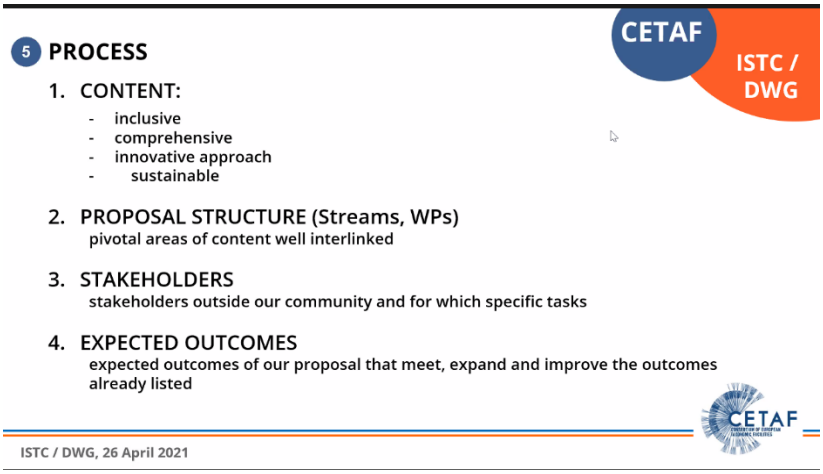
Ana Casino presented information about the upcoming Horizon Europe call on developing taxonomic capacity and the development of a proposal from CETAF.

- The Horizon Europe call has no name yet, called Call CL6 for now.
- Will be launched next year, but want to be ready in time to be successful. Building taxonomic expertise, networking. Call may still change by the time the call opens.

- It is at the core activities of CETAF. Networking between taxonomic facilities. Biodiversity hotspots, endangered species, … Green Deal, EU strategies, Birds and Habitats Directives. Our community is directly addressed.
- Expected outcomes : increase local taxonomic knowledge, reference to collections, pollinators, better digital technologies to be tested and implemented.
- Build a new generation of next taxonomist experts
- Integrative taxonomy beyond describing only species
- Highlight that need pilot actions : lot of tools have been developed, now need to have prototypes actually implemented.
- Target areas
  - 

  - Can add more areas, as developing the proposal.
- The proposal is channeled by the CETAF EIAG (European Initiative Advisor Group) to work together on a successful Bid
  - Initially it should have been a CSA and 5 Mio, but recently has moved to a Innovation action and 6 Mio. This means we need to outreach to the private sector. THis is the opportunity (see Anton's remarks on AI)
- Need to engage with other stakeholders:
  - 

- Liaison with other topics within Horizon Europe.
- Discussion points



- Are we addressing the right stakeholders
- Expected outcomes : check, are there others to include
- Results of today's discussions will feed into workshop of CETAF in May to go further development of the proposal.

Discussion

- Vince : Private sector is also driven by profit which make this more of a challenge
- Dagmar Triebel : perhaps also NGOs? non-for-Profit associations?
- Frederik Leliaert: What is the geographical scope : Call taxonomic capacity within Europe, specific focus of endangered species in Europe. But we know that European expertise is also on sites outside Europe. Because our expertises addresses worldwide is important. Collaborations with the international, sister organisations
- Quentin Groom Endangered species taxonomy are well known. For invasive species there are a lot of taxonomic questions as it comes from the outside. ---> even if not specified directly, if say of special interest surely invasive can be in.
- New tools are IT and Genetic tools, how will classical taxonomists react → if want to be successful need to support both and challenges that are technological. As it is now Innovation Action, it is also addressing how new tools may support our work. How to expand the description of a species to others. Better and innovative tools. Linking them both is the challenges and attracting the SMEs to our community may be more linked to this than to traditional taxonomic work.
- Dagmar Triebel : Can NGOs, Natural History societies (national, regional) be partners ---> can also be partners or stakeholders, citizen sciences, associations .. Challenges is that needs to be structured to address the right stakeholders. Scope, structure, identify the stakeholders and how to bring them in. NHM and taxonomy facilities should be the core and attract the others.
- VInce : Make small pockets of money to issue grants is interesting and an opportunity. The call is very broad, 6 Mio is not so much. Cannot do all of it. How to use it and focus. Making small funding intervention, to bring groups in and bring them in. Have conventional WPs and hard to be really impactful. It is tough concerning the amount of money
- Ana → directly address with footnote naming CETAF so huge opportunity, Had a CSA in mind, a traditional way to do it. Have been moved to a 6 Mio project and Innovation Action. Will most likely not be reverted to a CSA. Also not research. So we can have pilots, marketable products.

- It is a challenge but also an opportunity-- > need to reproducible and scaled up in future.
- Have time until fall 2022 to do a sound proposal.
- Need to understand priorities. Which is the really necessary
- Anton: Should we be restricting ourselves more to European Biodiversity for this call?
- Taxonomy expertise in Europe, but our experts affiliated to European institutions have also expertise outside Europe. But can define our priorities. Make a target. International of biodiversity understood worldwide could be considered. Depends also on us, to set the priorities. Which need to be discussed.
- Vince : Fields sites across Europe, explicit link with what we do; invasives , challenging, how to frame it . multitude of targets in the call text. Would read back to something valuable even if bigger in the future. Not to try to solve all the problems. Strong European projects.
- Ana: Could focus on a topic, for example invasive species, expertise from other outside Europe will come in naturally, depends on the area of interest to be targeted. Birds and habitat directive is in Europe, but we should be innovative and inclusive, until the scope is defined→ in the expression of interest be large and will later be narrowed down as the scope is defined
- Need all to reflect to come with a vision, read tread to build the proposal. What is needed for CETAF in May.
- **Link to expression of Interest : https://docs.google.com/forms/d/e/1FAIpQLSemor50UbcKmUuTqAaXl5PSgjZGCYSC7Hp5kANW35L0Nep8UA/viewform**
- **Concept note and current EU topic Call : https://drive.google.com/drive/u/0/folders/127ZjoY8DYtO9qNfrwC_iiQsiMzWA-Ts3**

Any Other Business (AOB) & Next meeting

- Check TDWG call for symposia and abstracts 2021 : https://www.tdwg.org/conferences/2021/ October 18-22 2021
- It was anticipated that the next meeting would also be a joint meeting with the ISTC, which it is hoped would take place in spring 2021 at the NHM in London.