International Training Centre for Environmental Research e.V. (ITCER)

DWB Training with ITCER tools and data in Africa

- Date: Wednesday, October 16, 2024, at 09:00 EAT

- Venue: ITCER, Ng'iya, Siaya County, Kenya

- Organizers: NFDI4Biodiversity, SNSB IT Center, ITCER Kenya

- Summary: The workshop will focus on ITCER training materials and gaming approaches, bringing together ITCER members, scientists, school teachers, and local government employees. It will explore new ITCER approaches, the integration of training datasets with the Diversity Workbench (DWB), and support for renaturation efforts in Siaya County. This 1-day workshop is part of ongoing research activities with organizations in Africa and Europe, aiming to mobilize biodiversity data in tropical Africa.

Agenda

- 09:00 EAT: Arrival at ITCER (Participants)

- 10:00 EAT: Welcome and introduction to ITCER (Gerhard Rambold)

- 10:15 EAT: Round of introductions (Tanja Weibulat, Participants)

- 10:30 EAT: Introduction to Diversity Workbench for data management (Tanja Weibulat)

- 10:45 EAT: ITCER APIs and DWB Interface Concepts (Stefan Seifert)

- 11:00 EAT: ITCER e-training tools and data products (G. R.)

- 11:30 EAT: Discussion and End of Hybrid Session

- 12:00 EAT: Lunch Break

- 13:30 EAT: ITCER training exercises - Scientific Ethics, Diversity, Macrobiome Matching, Metabolite Classes, and Amino Acids (G. R.)

- 14:15 EAT: Feedback and Discussion on Next Steps

- 15:30 EAT: End of Workshop

- 18:00 EAT: Dinner in Siaya town

ITCER – Focus Points and Activities
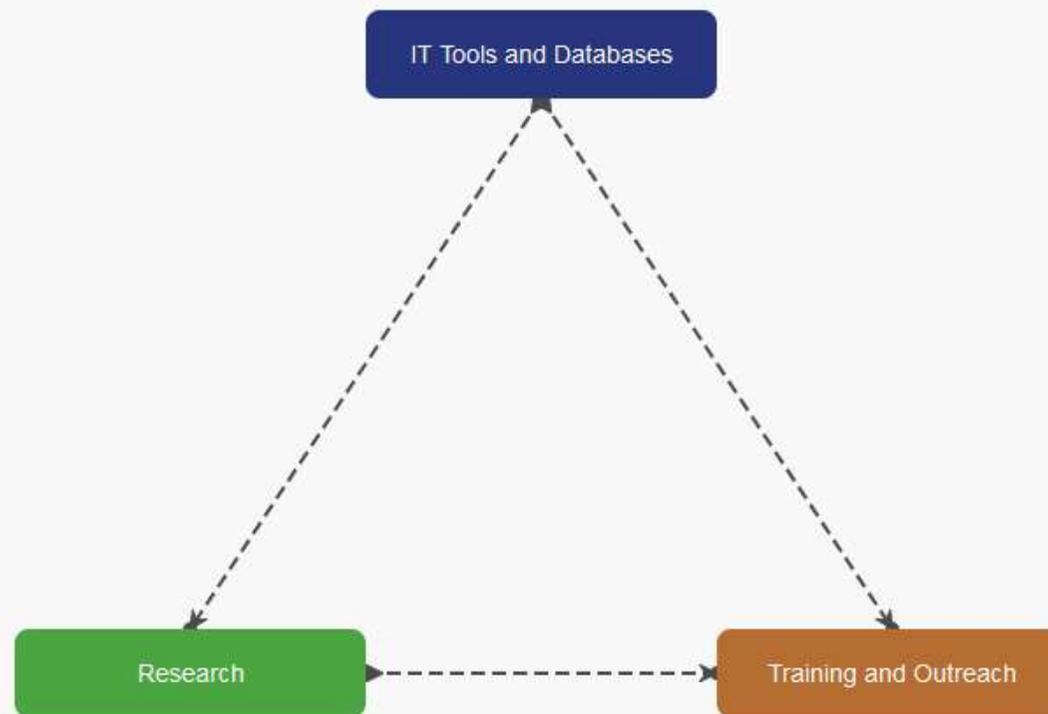
Biodiversity encompasses the variety of life in all its forms: the diversity of _____ within species, the diversity of _____ within ecosystems, and the diversity of _____ across regions. It is essential for the _____ and resilience of ecosystems, supporting critical processes such as _____ .

stability | pollination | populations | genes | ecosystems

Check Answer | Reset Exercise | New Phrase

Diversity Gap-fill Exercises

Biodiversity encompasses the variety of life in all its forms: the diversity of [genes] within species, the diversity of [ecosystems] within ecosystems, and the diversity of [populations] across regions. It is essential for the [stability] and resilience of ecosystems, supporting critical processes such as [pollination] .

Check Answer   Reset Exercise   New Phrase

Answers checked. Correct answers are highlighted in green, incorrect or unanswered ones in brown.

Biodiversity encompasses the variety of life in all its forms: the diversity of **genes** within species, the diversity of **populations** within ecosystems, and the diversity of **ecosystems** across regions. It is essential for the **stability** and resilience of ecosystems, supporting critical processes such as **pollination** .

| Check Answer | Reset Exercise | New Phrase |

Answers checked. Correct answers are highlighted in green, incorrect or unanswered ones in brown.

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International Training Centre
for Environmental Research

Diversity Gap-fill Exercises

Full Screen
Dark Mode
Biodiversity

Biodiversity
Genetic Diversity
Chemical Diversity
Functional Diversity
Alpha Diversity
Beta Diversity
Gamma Diversity

Full
Screen

Dark
Mode

Informed Consent

Informed Consent

Confidentiality and Data Protection

Conflict of Interest

Plagiarism and Academic Integrity

Animal Research Ethics

Data Normalization

Data Smoothing

Data Aggregation

Data Imputation

Data Transformation

![ITCER — International Training Centre for Environmental Research]

Macrobiome Memory Game

Select Grid Size: [6 × 6 ▾]   [Restart]   [New Game]   [Toggle Full Screen]   [Toggle Dark Mode]   [Load Rankings]

[Single Player Mode]   [Two Player Mode]

Educational Game

To test your knowledge, do the Name-Species Matching Exercises and the Species-Name Matching Exercises.

Macrobiome Memory Game

ITCER
International Training Centre
for Environmental Research

Select Grid Size: [5 × 5 ▾]   [Restart]   [New Game]   [Toggle Full Screen]   [Toggle Dark Mode]   [Load Rankings]

[Single Player Mode]   [Two Player Mode]

Clicks: 0

Enter your name: [Name]   [Save Score]

Ranking List (Grid Size: 5 × 5)

Note: The two start names with 999 clicks used in this game are fictitious and not representative of real people. Saving names is not yet supported and will be introduced shortly.

Educational Game

To test your knowledge, do the Name-Species Matching Exercises and the Species-Name Matching Exercises.

Macrobiome Memory Game

Select Grid Size: [5 × 5 ▾] [Restart] [New Game] [Toggle Full Screen] [Toggle Dark Mode] [Load Rankings]

[Single Player Mode] [Two Player Mode]

Clicks: 8

Danaus chrysippus chrysippus sp. (Nymphalidae (Brush-footed Butterflies))

Enter your name: [Name] [Save Score]

Ranking List (Grid Size: 5 × 5)

Note: The two start names with 999 clicks used in this game are fictitious and not representative of real people. Saving names is not yet supported and will be introduced shortly.

Educational Game

To test your knowledge, do the Name-Species Matching Exercises and the Species-Name Matching Exercises.

Drop Name Here | Drop Name Here | Drop Name Here | Drop Name Here | Drop Name Here | Drop Name Here | Drop Name Here | Drop Name Here | Drop Name Here

Drop Name Here

Synhoria cf. *cephalotes* (Meloidae (Blister beetles)) | *Peirates hybridus* (Reduviidae (Assassin Bugs)) | *Chrysis lincea* (Chrysididae (Cuckoo wasps)) | *Scolia* cf. *abyssinica* (Scoliidae (Scoliid Wasps))

Chamaecrista mimosoides (Fabaceae (Legume family)) | *Centropus superciliosus loandae* (Cuculidae (Cuckoos)) | *Argiope trifasciata* (Araneidae (Orb-weaver spiders)) | *Zizeeria knysna* (Lycaenidae (Gossamer-winged butterflies))

Striga hermontheca (Orobanchaceae (Broomrapes)) | *Mylothris rhodope* (Pieridae (Whites and Sulphurs))

Check Matching | Reset Exercise

Macrobiome Name-Species Matching Exercises

Full Screen   Dark Mode   10 Names ∨

Zizeeria knysna (Lycaenidae (Gossamer-winged butterflies))

Drop Name Here

Drop Name Here

Drop Name Here

Chamaecrista mimosoides (Fabaceae (Legume family))

Drop Name Here

Peirates hybridus (Reduviidae (Assassin Bugs))

Drop Name Here

Mylothris rhodope (Pieridae (Whites and Sulphurs))

Drop Name Here

Synhoria cf. *cephalotes* (Meloidae (Blister beetles))   *Chrysis lincea* (Chrysididae (Cuckoo wasps))   *Scolia* cf. *abyssinica* (Scoliidae (Scoliid Wasps))   *Centropus superciliosus loandae* (Cuculidae (Cuckoos))

Argiope trifasciata (Araneidae (Orb-weaver spiders))   *Striga hermontheca* (Orobanchaceae (Broomrapes))

Check Matching   Reset Exercise

Macrobiome Name-Species Matching Exercises

Full Screen | Dark Mode | 10 Names ▾

Zizeeria knysna
(Lycaenidae
(Gossamer-winged
butterflies))

Argiope trifasciata
(Araneidae (Orb-weaver
spiders))

Chrysis lincea
(Chrysididae (Cuckoo
wasps))

Scolia cf. abyssinica
(Scoliidae (Scoliid
Wasps))

Chamaecrista
mimosoides (Fabaceae
(Legume family))

Centropus
superciliosus loandae
(Cuculidae (Cuckoos))

Peirates hybridus
(Reduviidae (Assassin
Bugs))

Synhoria cf. cephalotes
(Meloidae (Blister
beetles))

Mylothris rhodope
(Pieridae (Whites and
Sulphurs))

Striga hermontheca
(Orobanchaceae
(Broomrapes))

Check Matching | Reset Exercise

Macrobiome Name-Species Matching Exercises

Zizeeria knysna (Lycaenidae (Gossamer-winged butterflies))

Argiope trifasciata (Araneidae (Orb-weaver spiders))

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Synhoria cf. cephalotes (Meloidae (Blister beetles))

Mylothris rhodope (Pieridae (Whites and Sulphurs))

Striga hermontheca (Orobanchaceae (Broomrapes))

Check Matching | Reset Exercise

Centropus superciliosus loandae (Cuculidae (Cuckoos))

Centropus superciliosus loandae is a subspecies of coucal in the family Cuculidae, known for its secretive behavior and often heard rather than seen in dense vegetation.

Educational Game
To improve your knowledge, play the Alpha Diversity Memory Game.

Lycus
cf.
trabeatus
(Lycidae (Net-winged beetles))

Drag Image Here

cf.
Melittidae
sp.
(Melittidae (Melittid bees))

Drag Image Here

Centella asiatica
(Apiaceae (Carrot Family))

Drag Image Here

Cryptacrus comes
(Scutelleridae (Shield bugs))

Drag Image Here

Chamaeleo dilepis
(Chamaeleonidae (Chamaeleons))

Drag Image Here

Check Matching | Reset Exercise

Lycus
cf.
trabeatus
(Lycidae (Net-winged beetles))

cf.
Melittidae
sp.
(Melittidae (Melittid bees))

Centella asiatica
(Apiaceae (Carrot Family))

Cryptacrus comes
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(Chamaeleonidae (Chamaeleons))

Check Matching | Reset Exercise

Lycus
cf.
trabeatus
(Lycidae (Net-winged beetles))

cf.
Melittidae
sp.
(Melittidae (Melittid bees))

Centella asiatica
(Apiaceae (Carrot Family))

Cryptacrus comes
(Scutelleridae (Shield bugs))

Chamaeleo dilepis (Chamaeleonidae (Chamaeleons))   ✕

Chamaeleo dilepis is a species of chameleon in the family Chamaeleonidae.
Chameleons are known for their ability to change color and their independently
movable eyes.

Drop Name Here

Drop Name Here

Drop Name Here

Drop Name Here

Drop Name Here

Benzopyrans

Arenes

Drop Name Here

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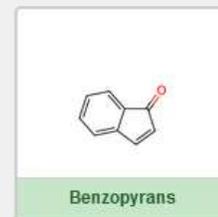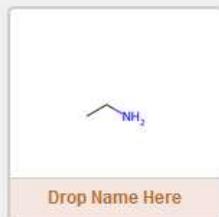
Drop Name Here

Quinones | Amines | Amino-Acid Derivatives | Polymers | Lignans | Carbohydrates | Isoprenoids | Steroids

Check Matching | Reset Exercise | New Exercise
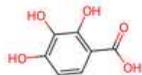
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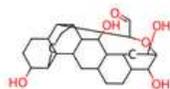
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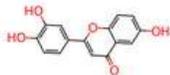

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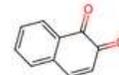
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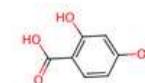
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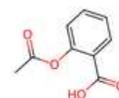
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Amines   Carboxylic Acid Derivatives   Betalains   Saponins   Benzofurans   Flavonoids   Quinones   Alcohols   Aliphatic Lactones

Phenol Carboxylic Acid Derivatives

Check Matching   Reset Exercise   New Exercise

# Amino Acid Formulas Matching Exercises

Full Screen | Dark Mode | 5 Names ⌄
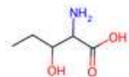
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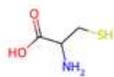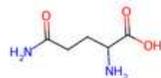
Drop Name Here
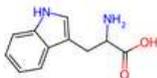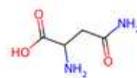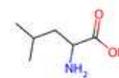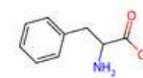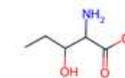
Drop Name Here

Drop Name Here

Drop Name Here

Cysteine | Asparagine | Alanine | Threonine | Phenylalanine

Check Matching | Reset Exercise | New Exercise

Inkscape

Drop Name Here   Drop Name Here   Drop Name Here   Drop Name Here   Drop Name Here   Drop Name Here   Drop Name Here
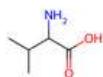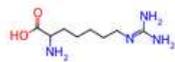
Drop Name Here   Drop Name Here   Drop Name Here   Drop Name Here   Drop Name Here   Drop Name Here   Drop Name Here
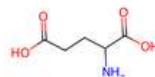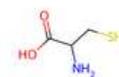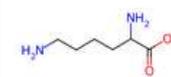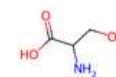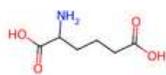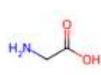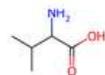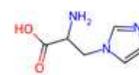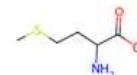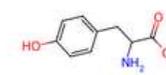
Drop Name Here   Drop Name Here   Drop Name Here   Drop Name Here   Drop Name Here   Drop Name Here

Cysteine   Glycine   Leucine   Serine   Methionine   Asparagine   Isoleucine   Glutamic Acid   Tryptophan   Tyrosine   Alanine   Phenylalanine

Glutamine   Threonine   Proline   Lysine   Aspartic Acid   Histidine   Valine   Arginine

Check Matching   Reset Exercise   New Exercise

Educational Game

Biodiversity Monitoring Workflow

From Field Monitoring to Regional GIS and Taxon Maintenance
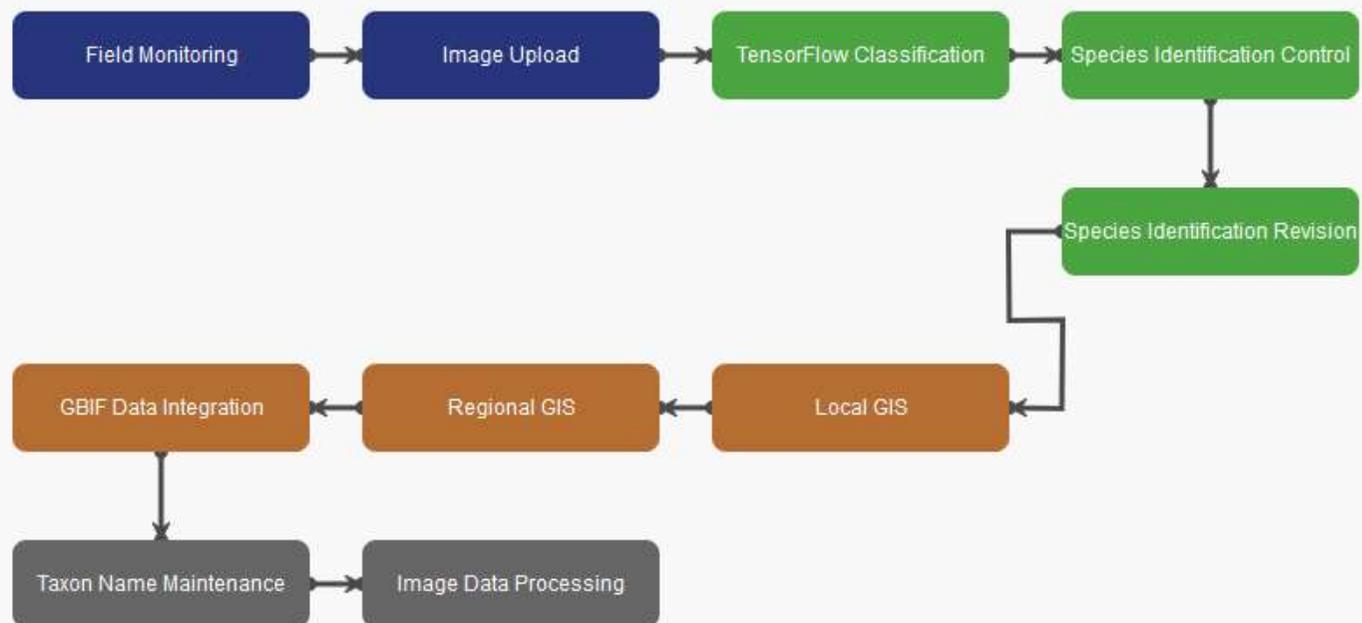
Biodiversity Monitoring Workflow

From Field Monitoring to GBIF Integration with ABCD and DwC Mapping

Field Monitoring

Image Upload

EXIF Data

Image Content Data

EXIF Data Extraction

TensorFlow Classification

JSON Format with Proprietary

Mapping Activity to ABCD

ABCD-xsd XML Subset (Mapped

DWB Database (Outputs ABCD

Direct GBIF Integration

GBIF (Reads ABCD via DwC

Protocols
- ODCB
- HTTPS

Interfaces
- API

Schemas
- ABCD Schema

Formats
- XML Format
- JSON Format

Biodiversity Monitoring Workflow

From Field Monitoring to GBIF Integration with ABCD and DwC Mapping

Field Monitoring

Image Upload

EXIF Data

Image Content Data

EXIF Data Extraction

TensorFlow Classification

Latitude: 0.032878
Longitude: 34.362673
Altitude: 1408.7
Date Taken: 2024:07:03 17:03:18

JSON Format with Proprietary

Mapping Activity to ABCD

ABCD-xsd XML Subset (Mapped

DWB Database (Outputs ABCD

Direct GBIF Integration

GBIF (Reads ABCD via DwC
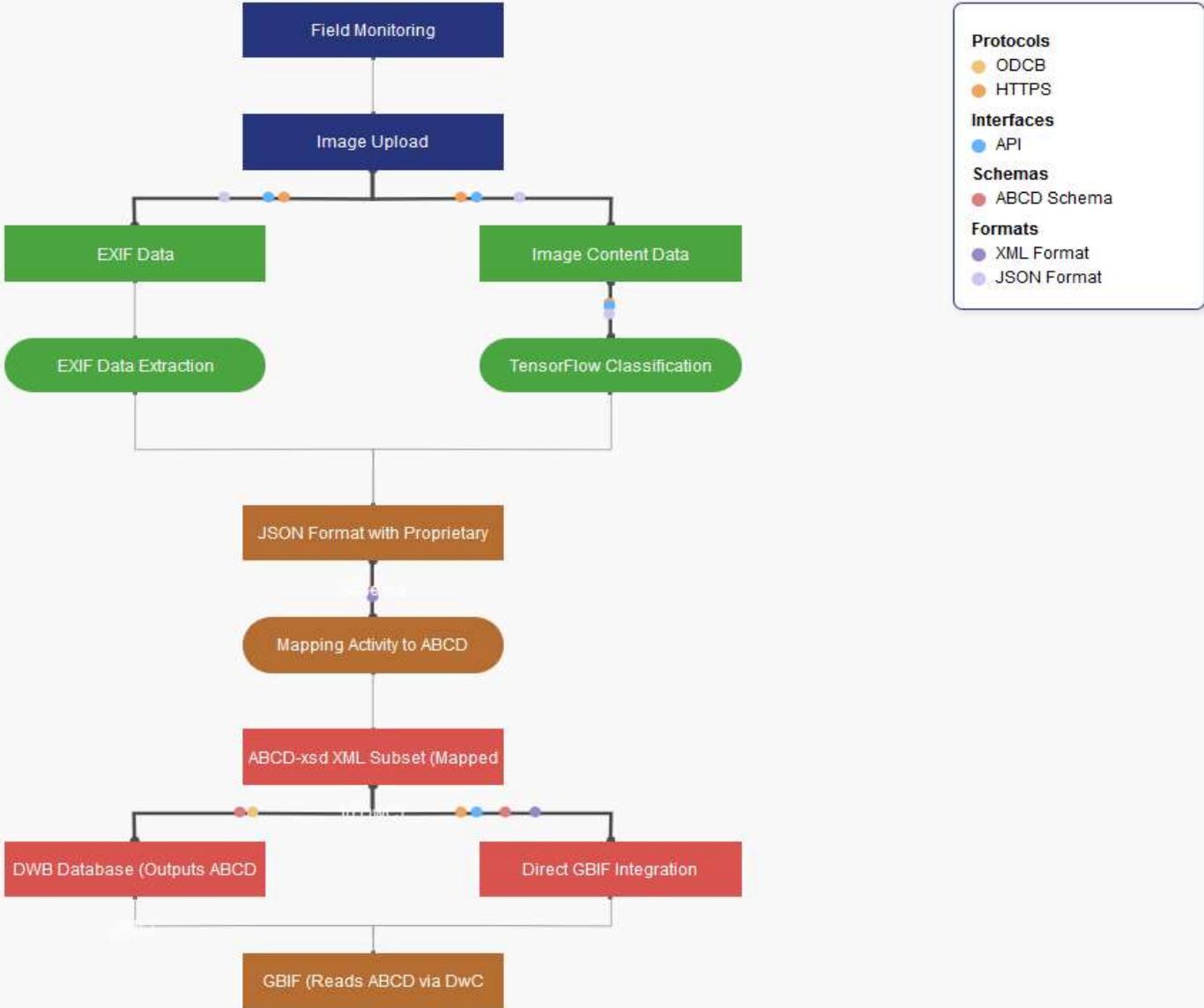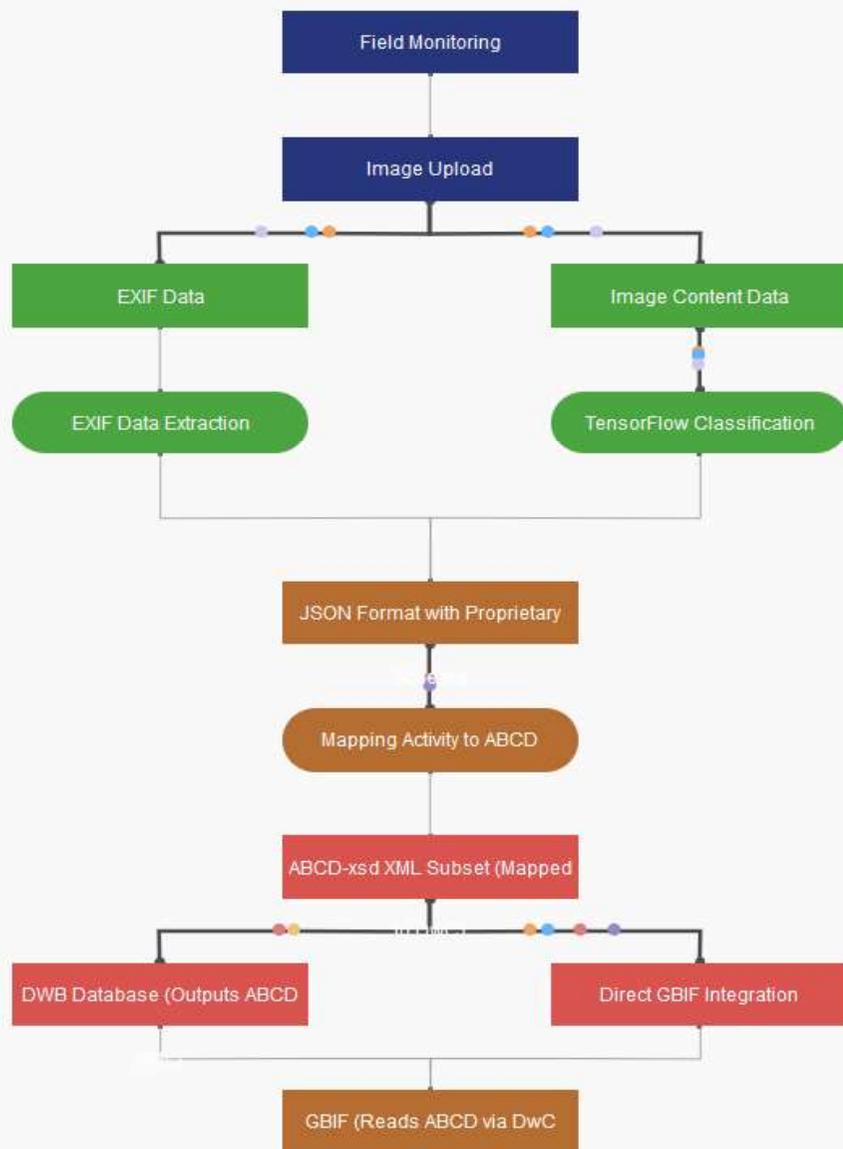
Protocols
- ODCB
- HTTPS

Interfaces
- API

Schemas
- ABCD Schema

Formats
- XML Format
- JSON Format

Biodiversity Monitoring Workflow - UML Activity Diagram

From Field Monitoring to GBIF Integration with ABCD and DwC Mapping

Latitude: 0.032878
Longitude: 34.362673
Altitude: 1408.7
Date Taken: 2024:07:03 17:03:18

Legend
- ODCB
- API

Field Monitoring

Image Upload

EXIF Data → EXIF Data Extraction

Image Content Data → TensorFlow Classification

JSON Format with Proprietary Schema

Mapping Activity to ABCD

ABCD-xsd XML Subset (Mapped to

DWB Database (Outputs ABCD XML)

Direct GBIF Integration

GBIF (Reads ABCD via DwC

```json
{
    "Filename": "MO_DSC09084_2024-07-03_17-03-18.jpg",
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    "Longitude": "34.362673",
    "Altitude": "1408.7",
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    "CameraModel": "DSC-HX90V",
    "URL": "https://itcer.org/basics/upload_mobile/MO_DSC09084_2024-07-03_17-03-18.jpg",
    "Title": "Tylosema fassoglensis \u2013 undefined.undefined.2024-10-04",
    "Comments": "",
    "Identification / Revision taxon name": "Tylosema fassoglensis",
    "Identification / Revision date": "2024-10-04",
    "Identification / Revision author": "Rambold, Gerhard",
    "ID": "387da0e1-2929-4383-90b1-bde9ba38c1f9",
    "Folder": "mobile",
    "deleted": true,
    "authorInput": [
    ],
    "titleDiv": []
},
```

{
 "Filename": "**MO_DSC09084_2024-07-03_17-03-18.jpg**",
 "Latitude": "**0.032878**",
 "Longitude": "**34.362673**",
 "Altitude": "1408.7",
 "DateTimeOriginal": "**2024:07:03 17:03:18**",
 "CameraModel": "**DSC-HX90V**",
 "URL": "https://itcer.org/basics/upload_mobile/MO_DSC09084_2024-07-03_17-03-18.jpg",
 "Title": "Tylosema fassoglensis \u2013 undefined.undefined.2024-10-04",
 "Comments": "",
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 "ID": "387da0e1-2929-4383-90b1-bde9ba38c1f9",
 "Folder": "mobile",
 "deleted": true,
 "authorInput": [
 ],
 "titleDiv": []
},

ABCD Subset based on DC (xsd format)

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 <xs:element xmlns:ns9="http://www.w3.org/ns/sawsdl" name="TypifiedName" type="ScientificName" minOccurs="0" ns9:modelReference="http://rs.tdwg.org/abcd/mappings/TypifiedName"/>
 <xs:element xmlns:ns10="http://www.w3.org/ns/sawsdl" name="AssemblageName" type="StringL" minOccurs="0" ns10:modelReference="http://rs.tdwg.org/abcd/mappings/Assemblage-Name"/>
 <xs:element xmlns:ns11="http://www.w3.org/ns/sawsdl" name="CollectorName" type="String" minOccurs="0" ns11:modelReference="http://rs.tdwg.org/abcd/mappings/FieldNumber-CollectorName"/>
 <xs:element xmlns:ns12="http://www.w3.org/ns/sawsdl" name="Sex" type="SexCodeEnum" minOccurs="0" ns12:modelReference="http://rs.tdwg.org/abcd/terms/Sex"/>
 <xs:element xmlns:ns13="http://www.w3.org/ns/sawsdl" name="ISODateTimeBegin" type="DateTimeISO" minOccurs="0" ns13:modelReference="http://rs.tdwg.org/abcd/terms/timeSpanBegin"/>
 <xs:element xmlns:ns14="http://www.w3.org/ns/sawsdl" name="ISODateTimeEnd" type="DateTimeISO" minOccurs="0" ns14:modelReference="http://rs.tdwg.org/abcd/terms/timeSpanEnd"/>
 <xs:element xmlns:ns15="http://www.w3.org/ns/sawsdl" name="Sex" type="String" minOccurs="0" ns15:modelReference="http://rs.tdwg.org/dwc/terms/sex"/>
 <xs:element xmlns:ns16="http://www.w3.org/ns/sawsdl" name="CodecName" type="String" minOccurs="0" ns16:modelReference="http://rs.tdwg.org/abcd/terms/codecName"/>
 <xs:element name="Name" type="Label"/>
 <xs:element name="PersonName">
  <xs:element xmlns:ns17="http://www.w3.org/ns/sawsdl" name="FullName" type="String255" ns17:modelReference="http://rs.tdwg.org/abcd/terms/fullName"/>
  <xs:element xmlns:ns18="http://www.w3.org/ns/sawsdl" name="SortingName" type="String255" minOccurs="0" ns18:modelReference="http://rs.tdwg.org/abcd/terms/sortingName"/>
  <xs:element name="AtomizedName" minOccurs="0">
   <xs:element xmlns:ns19="http://www.w3.org/ns/sawsdl" name="InheritedName" type="String255" ns19:modelReference="http://rs.tdwg.org/abcd/terms/inheritedName"/>
   <xs:element xmlns:ns20="http://www.w3.org/ns/sawsdl" name="PreferredName" type="String255" minOccurs="0" ns20:modelReference="http://rs.tdwg.org/abcd/terms/preferredName"/>
  </xs:element>
 </xs:element>
 <xs:element xmlns:ns21="http://www.w3.org/ns/sawsdl" name="InfrasubspecificName" type="String" minOccurs="0" ns21:modelReference="http://rs.tdwg.org/abcd/terms/infrasubspecificName"/>
 <xs:element xmlns:ns22="http://www.w3.org/ns/sawsdl" name="CultureName" type="StringL" maxOccurs="unbounded" ns22:modelReference="http://rs.tdwg.org/abcd/terms/cultureName"/>
 <xs:element xmlns:ns23="http://www.w3.org/ns/sawsdl" name="AccessionName" type="String" maxOccurs="unbounded" ns23:modelReference="http://rs.tdwg.org/abcd/terms/accessionName"/>
 <xs:element xmlns:ns24="http://www.w3.org/ns/sawsdl" name="Name" type="StringL" minOccurs="0" ns24:modelReference="http://rs.tdwg.org/abcd/mappings/Country-Name"/>
 <xs:element xmlns:ns25="http://www.w3.org/ns/sawsdl" name="ISO3166Code" type="String" minOccurs="0" ns25:modelReference="http://rs.tdwg.org/abcd/terms/iso3166Code"/>
 <xs:element xmlns:ns26="http://www.w3.org/ns/sawsdl" name="LowerValue" type="StringL" ns26:modelReference="http://rs.tdwg.org/abcd/terms/lowerValue"/>
 <xs:element xmlns:ns27="http://www.w3.org/ns/sawsdl" name="UpperValue" type="StringL" minOccurs="0" ns27:modelReference="http://rs.tdwg.org/abcd/terms/upperValue"/>
 <xs:element xmlns:ns28="http://www.w3.org/ns/sawsdl" name="Owner" type="Contact" maxOccurs="unbounded" ns28:modelReference="http://rs.tdwg.org/abcd/mappings/Owner http://rs.tdwg.org/abcd/mappings/DataSet-Owner"/>
 <xs:element xmlns:ns29="http://www.w3.org/ns/sawsdl" name="ScientificName" type="ScientificNameIdentified" minOccurs="0" ns29:modelReference="http://rs.tdwg.org/abcd/terms/ScientificName"/>
 <xs:element xmlns:ns30="http://www.w3.org/ns/sawsdl" name="InformalName" type="StringL" minOccurs="0" ns30:modelReference="http://rs.tdwg.org/abcd/terms/informalName"/>
 <xs:element xmlns:ns31="http://www.w3.org/ns/sawsdl" name="CultivarGroupName" type="String" minOccurs="0" ns31:modelReference="http://rs.tdwg.org/abcd/terms/cultivarGroupName"/>
 <xs:element xmlns:ns32="http://www.w3.org/ns/sawsdl" name="CultivarName" type="String" minOccurs="0" ns32:modelReference="http://rs.tdwg.org/abcd/terms/cultivarName"/>
 <xs:element xmlns:ns33="http://www.w3.org/ns/sawsdl" name="TradeDesignationName" type="String" maxOccurs="unbounded" ns33:modelReference="http://rs.tdwg.org/abcd/terms/tradeDesignationName"/>
 <xs:element name="ScientificName">
  <xs:element xmlns:ns34="http://www.w3.org/ns/sawsdl" name="FullScientificName" type="String" ns34:modelReference="http://rs.tdwg.org/abcd/terms/fullScientificName"/>
 </xs:element>
 <xs:element xmlns:ns35="http://www.w3.org/ns/sawsdl" name="HigherTaxonName" type="Monomial" ns35:modelReference="http://rs.tdwg.org/abcd/mappings/HigherTaxonName"/>
</xs:schema>
```

DWB Architecture Diagram