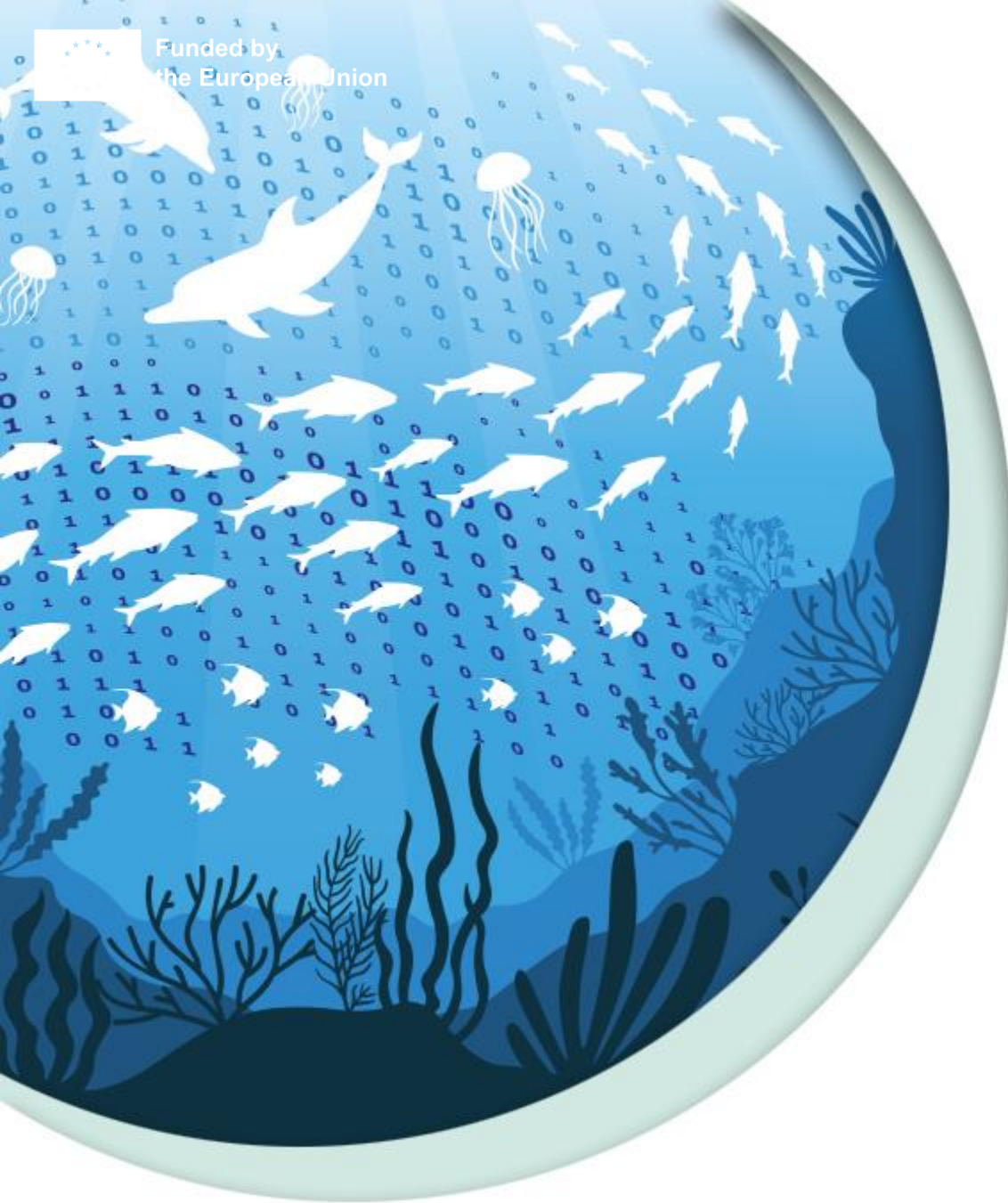




Funded by  
the European Union



# DTO-BioFlow

Integration of biodiversity monitoring  
data into the Digital Twin Ocean

DTO-BioFlow data training  
workshop:

Value standardization

# Value standardization

- Consistent values not only within a dataset, but across datasets
- Values can be standardized using a controlled vocabulary, or by using a specific format or data type

language	
Identifier	<a href="http://purl.org/dc/elements/1.1/language">http://purl.org/dc/elements/1.1/language</a>
Definition	A language of the resource.
Comments	Recommended best practice is to use a <b>controlled vocabulary</b> such as RFC 5646.

Examples

**en** (for English)

**es** (for Spanish)

## eventDate

Identifier	<a href="http://rs.tdwg.org/dwc/terms/eventDate">http://rs.tdwg.org/dwc/terms/eventDate</a>
Definition	The date-time or interval during which a dwc:Event occurred. For occurrences, this is the date-time when the dwc:Event was recorded. Not suitable for a time in a geological context.
Comments	Recommended best practice is to use a date that conforms to <b>ISO 8601-1:2019</b> .

## month

Identifier	<a href="http://rs.tdwg.org/dwc/terms/month">http://rs.tdwg.org/dwc/terms/month</a>
Definition	The <b>integer</b> month in which the dwc:Event occurred.
Comments	

Examples

**1** (January)

**10** (October)

# Value standardization

- ≡ Consistent values not only within a dataset, but across datasets
- ≡ Values can be standardized using a controlled vocabulary, or by using a specific format or data type
- ≡ In some cases values can be standardized by adding an ID from a controlled vocabulary for that value in a separate column

scientificNameID	
Identifier	<a href="http://rs.tdwg.org/dwc/terms/scientificNameID">http://rs.tdwg.org/dwc/terms/scientificNameID</a>
Definition	An identifier for the nomenclatural (not taxonomic) details of a scientific name.
Comments	
Examples	<a href="urn:lsid:ipni.org:names:37829-1:1.3">urn:lsid:ipni.org:names:37829-1:1.3</a>

higherGeographyID	
Identifier	<a href="http://rs.tdwg.org/dwc/terms/higherGeographyID">http://rs.tdwg.org/dwc/terms/higherGeographyID</a>
Definition	An identifier for the geographic region within which the dcterms:Location occurred.
Comments	Recommended best practice is to use a persistent identifier from a controlled vocabulary such as the Getty Thesaurus of Geographic Names.
Examples	<a href="http://vocab.getty.edu/tgn/1002002">http://vocab.getty.edu/tgn/1002002</a> (Antártida e Islas del Atlántico Sur, Territorio Nacional de la Tierra del Fuego, Argentina).

# Value standardization

- ≡ How to standardize depends on the field
  - ≡ General recommendations: check DwC terms definitions and comments
  - ≡ More specific recommendations: repository (e.g. OBIS, EMODnet Biology)
- ≡ Let's look into more detail into:
  - ≡ Taxonomy
  - ≡ Geography
  - ≡ Time

# Value standardization

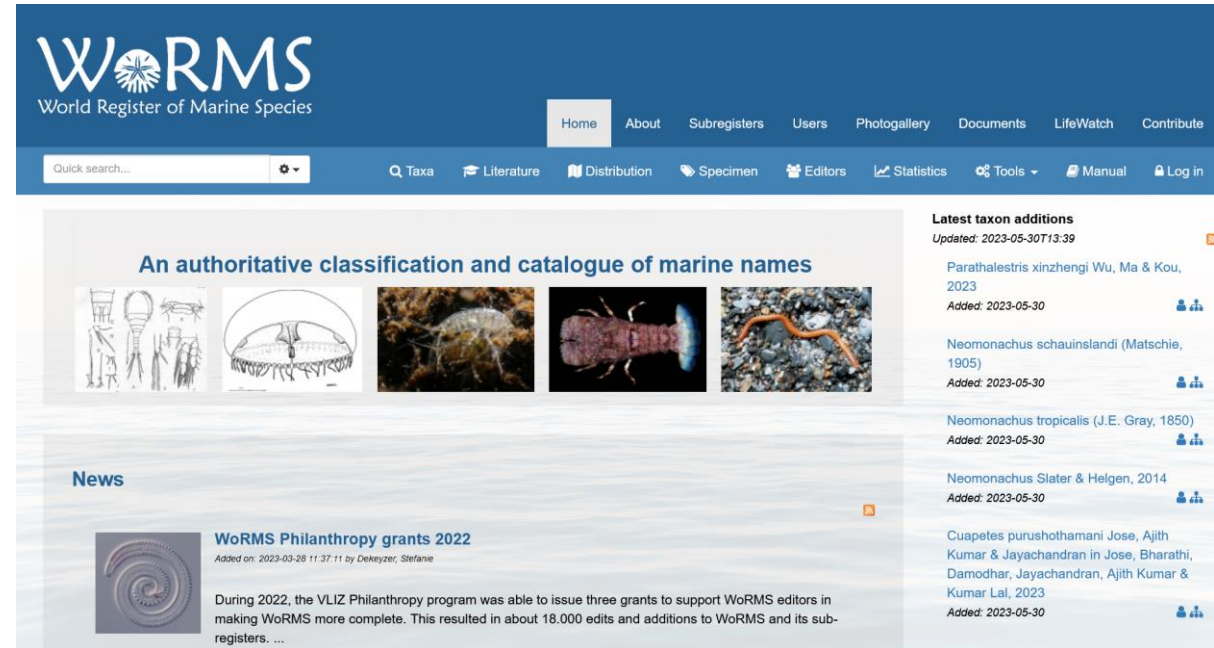
- ≡ How to standardize depends on the field
- ≡ Let's look into more detail into:
  - ≡ **Taxonomy**
  - ≡ Geography
  - ≡ Time



# Taxonomic standardization

≡ Match names to an authoritative taxonomic register

≡ Taxonomic backbone of OBIS:  
World Register of Marine Species  
(WoRMS)



The screenshot shows the WoRMS website interface. At the top is the WoRMS logo and the text "World Register of Marine Species". Below this is a navigation bar with links: Home, About, Subregisters, Users, Photogallery, Documents, LifeWatch, and Contribute. A search bar is located on the left of the navigation bar. Below the navigation bar is a section titled "An authoritative classification and catalogue of marine names" with five small images of marine organisms. To the right of this section is a "Latest taxon additions" section with a list of recent additions, including *Parathalestris xinzhengi* Wu, Ma & Kou, 2023, *Neomonachus schauinslandi* (Matschie, 1905), *Neomonachus tropicalis* (J.E. Gray, 1850), *Neomonachus Slater & Helgen*, 2014, and *Cuapetes purushothamani* Jose, Ajith Kumar & Jayachandran in Jose, Bharathi, Damodhar, Jayachandran, Ajith Kumar & Kumar Lal, 2023. Below the "Latest taxon additions" section is a "News" section with a headline "WoRMS Philanthropy grants 2022" and a brief description of the grants.

# Taxonomic standardization

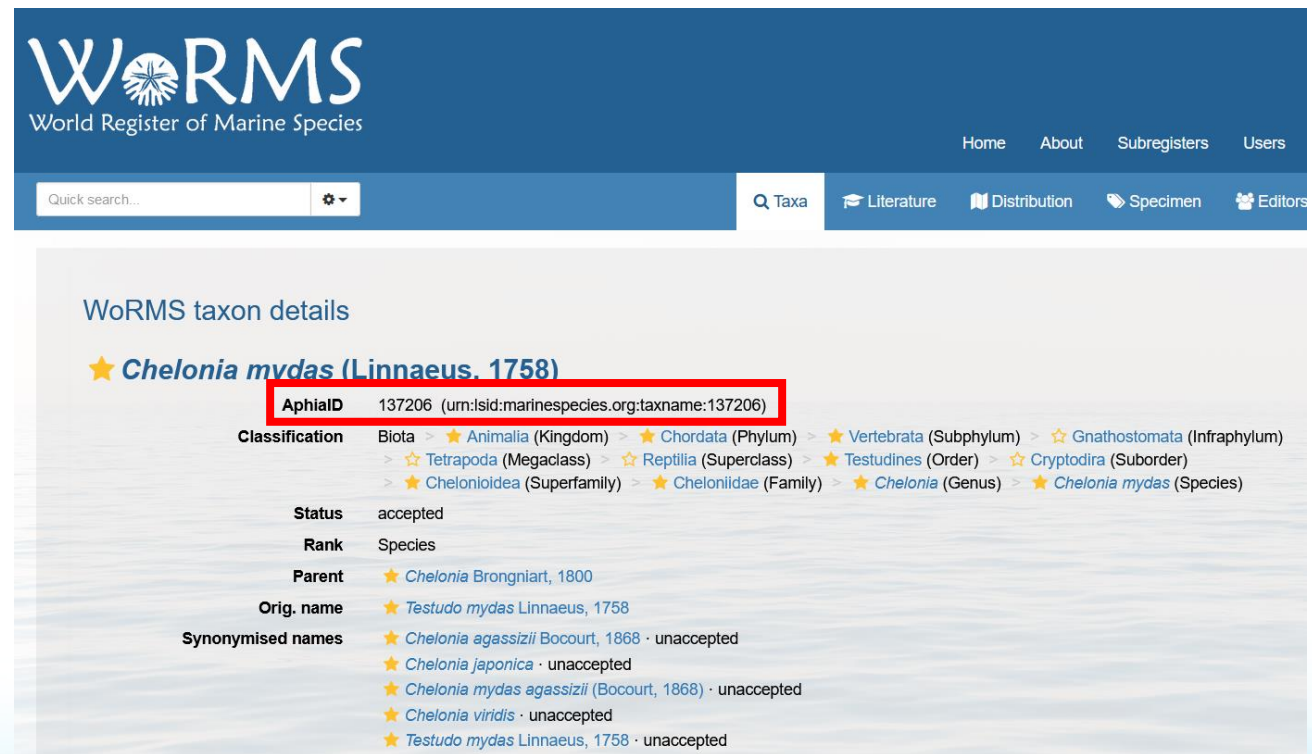
≡ Match names to an authoritative taxonomic register

≡ → Attach unique stable identifiers

≡ WoRMS LSIDs

≡ → Keep up with changing taxonomy

≡ → Avoid misspellings



WoRMS  
World Register of Marine Species

Quick search... [Settings]

Q Taxa Literature Distribution Specimen Editors

Home About Subregisters Users

WoRMS taxon details

★ *Chelonia mydas* (Linnaeus, 1758)

AphialID 137206 (um:lsid:marinespecies.org:taxname:137206)

Classification Biota > ★ Animalia (Kingdom) > ★ Chordata (Phylum) > ★ Vertebrata (Subphylum) > ★ Gnathostomata (Infraphylum) > ★ Tetrapoda (Megaclass) > ★ Reptilia (Superclass) > ★ Testudines (Order) > ★ Cryptodira (Suborder) > ★ Chelonioidea (Superfamily) > ★ Cheloniidae (Family) > ★ Chelonia (Genus) > ★ Chelonia mydas (Species)

Status accepted

Rank Species

Parent ★ Chelonia Brongniart, 1800

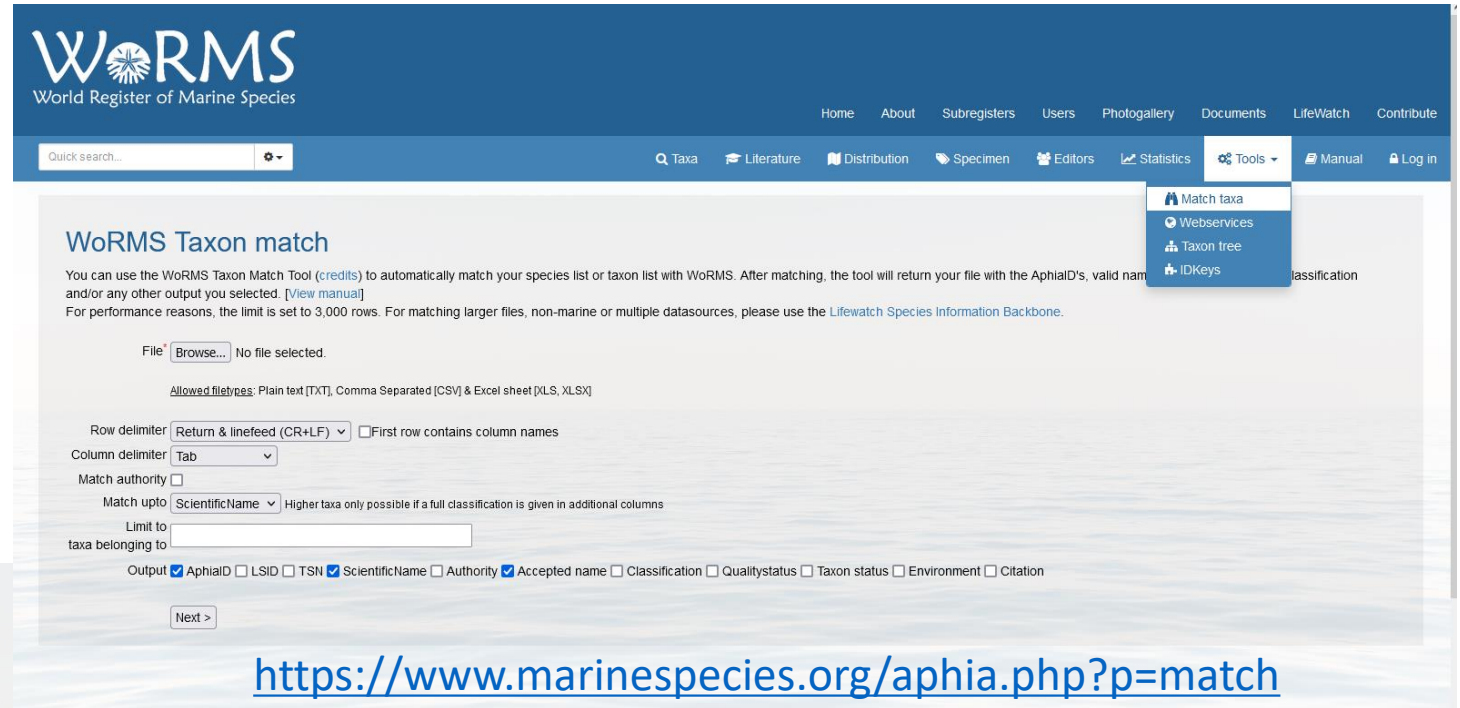
Orig. name ★ Testudo mydas Linnaeus, 1758

Synonymised names

- ★ Chelonia agassizii Bocourt, 1868 · unaccepted
- ★ Chelonia japonica · unaccepted
- ★ Chelonia mydas agassizii (Bocourt, 1868) · unaccepted
- ★ Chelonia viridis · unaccepted
- ★ Testudo mydas Linnaeus, 1758 · unaccepted

# Taxonomic standardization

- ≡ WoRMS Taxon Match
- ≡ WoRMS Taxon Match Tool
- ≡ REST API
- ≡ Worrms (R client)



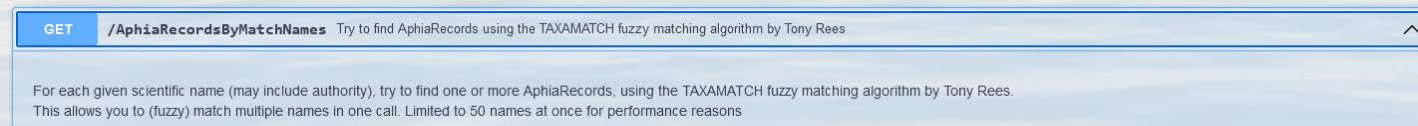
The screenshot shows the WoRMS (World Register of Marine Species) Taxon Match Tool interface. The header includes the WoRMS logo and navigation links: Home, About, Subregisters, Users, Photogallery, Documents, LifeWatch, and Contribute. A search bar is present with a dropdown menu showing options like Match taxa, Webservices, Taxon tree, and IDKeys. The main content area is titled "WoRMS Taxon match" and provides instructions on how to use the tool. It includes a file upload section with a "Browse..." button and a "No file selected." message. Below this, there are settings for "Allowed filetypes" (Plain text [TXT], Comma Separated [CSV] & Excel sheet [XLS, XLSX]), "Row delimiter" (Return & linefeed [CR+LF]), "Column delimiter" (Tab), "Match authority" (checkbox), "Match upto" (ScientificName), and "Limit to" (taxa belonging to). The "Output" section has checkboxes for AphiaID, LSID, TSN, ScientificName, Authority, Accepted name, Classification, Qualitystatus, Taxon status, Environment, and Citation. A "Next >" button is at the bottom.

<https://www.marinespecies.org/aphia.php?p=match>

## WoRMS REST webservice

<https://www.marinespecies.org/restapi-docs/swagger.yaml>

The definitions and operations are listed below. Click on an operation name to view it's details, and test it.



The screenshot shows the REST API documentation for the "AphiaRecordsByMatchNames" endpoint. The endpoint is listed as "GET /AphiaRecordsByMatchNames" with a description: "Try to find AphiaRecords using the TAXAMATCH fuzzy matching algorithm by Tony Rees". Below the endpoint name, there is a description: "For each given scientific name (may include authority), try to find one or more AphiaRecords, using the TAXAMATCH fuzzy matching algorithm by Tony Rees. This allows you to (fuzzy) match multiple names in one call. Limited to 50 names at once for performance reasons".

<https://www.marinespecies.org/rest/>



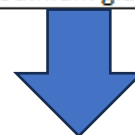
# Taxonomic standardization

## WoRMS Taxon Match

### ≡ Clean names before matching

- ≡ name for matching: only the scientific name of the taxon
- ≡ Other information should go in other fields

Name as provided	scientificName	scientificNameAuthor	lifeStage	sex	maximum length
Polysiphonia Greville, 1823	Polysiphonia	Greville, 1823			
Nephtys juv.	Nephtys		juv.		
Eupagurus pubescens zoea	Eupagurus pubescens		zoea		
Corbula crassa male adult	Corbula crassa		adult	male	
Katodinium glaucum <20um	Katodinium glaucum				20um



Use this column for the  
taxon match

# Taxonomic standardization

## WoRMS Taxon Match

### ≡ Clean names before matching

≡ scientificName: only the  
scientific name of the taxon

≡ Other information should go in  
other fields

≡ Uncertainty → scientificName:  
the lowest taxonomic level at  
which there is certainty

≡ *Cladocera/Ostracoda*  
→ *Crustacea*

Name as provided	scientificName	scientificNameAuthor	lifeStage	sex	maximum length
Polysiphonia Greville, 1823	Polysiphonia	Greville, 1823			
Nephtys juv.	Nephtys		juv.		
Eupagurus pubescens zoea	Eupagurus pubescens		zoea		
Corbula crassa male adult	Corbula crassa		adult	male	
Katodinium glaucum <20um	Katodinium glaucum				20um

### ★ Ostracoda

AphiaID

1078 (urn:lsid:marinespecies.org:taxname:1078)

Classification

Biota > ★ Animalia (Kingdom) > ★ Arthropoda (Phylum) > ★ Crustacea (Subphylum) > ★ Oligostraca (Superclass) > ★ Ostracoda (Class)

### ★ Cladocera

AphiaID

1076 (urn:lsid:marinespecies.org:taxname:1076)

Classification

Biota > ★ Animalia (Kingdom) > ★ Arthropoda (Phylum) > ★ Crustacea (Subphylum) > ★ Allotricarida (Superclass) > ★ Branchiopoda (Class) > ★ Phylopoda (Subclass) > ★ Diplostraca (Superorder) > ★ Cladocera (Order)

# Taxonomic standardization

## WoRMS Taxon Match

### ≡ Clean names before matching

- ≡ scientificName: only the scientific name of the taxon
- ≡ Other information should go in other fields
- ≡ Uncertainty → scientificName: the lowest taxonomic level at which there is certainty
  - ≡ *Cladocera/Ostracoda* → *Crustacea*
  - ≡ *Gadus cf. morhua* → *Gadus*
  - ≡ *Gadus morhua / macrocephalus* → *Gadus*
  - ≡ Mesozooplankton → *Animalia*

Name as provided	scientificName	scientificNameAuthor	lifeStage	sex	maximum length
Polysiphonia Greville, 1823	Polysiphonia	Greville, 1823			
Nephtys juv.	Nephtys		juv.		
Eupagurus pubescens zoea	Eupagurus pubescens		zoea		
Corbula crassa male adult	Corbula crassa		adult	male	
Katodinium glaucum <20um	Katodinium glaucum				20um

# Taxonomic standardization

## WoRMS Taxon Match

### ≡ Clean names before matching

- ≡ scientificName: only the scientific name of the taxon
- ≡ Other information should go in other fields
- ≡ Uncertainty → scientificName: the lowest taxonomic level at which there is certainty
  - ≡ identificationQualifier should contain the uncertain part (e.g. cf. *morhua*)
  - ≡ If it is not a taxonomic name, add it in taxonRemarks (e.g. mesozooplankton)

Name as provided	scientificName	scientificNameAuthor	lifeStage	sex	maximum length
Polysiphonia Greville, 1823	Polysiphonia	Greville, 1823			
Nephtys juv.	Nephtys		juv.		
Eupagurus pubescens zoea	Eupagurus pubescens		zoea		
Corbula crassa male adult	Corbula crassa		adult	male	
Katodinium glaucum <20um	Katodinium glaucum				20um

Name as provided	scientificName	identificationQualifier	taxonRemarks
Cladocera/Ostracoda	Crustacea	Cladocera/Ostracoda	
Gadus cfr. morhua	Gadus	cfr. morhua	
Mesozooplankton	Animalia		Mesozooplankton
Gadus morhua / macrocephalus	Gadus	morhua / macrocephalus	



# Taxonomic standardization

## WoRMS Taxon Match

### ≡ Clean names before matching

- ≡ scientificName: only the scientific name of the taxon
- ≡ Other information should go in other fields
- ≡ Uncertainty → scientificName: the lowest taxonomic level at which there is certainty
- ≡ Name as provided can go in verbatimIdentification

Name as provided	scientificName	scientificNameAuthor	lifeStage	sex	maximum length
Polysiphonia Greville, 1823	Polysiphonia	Greville, 1823			
Nephtys juv.	Nephtys		juv.		
Eupagurus pubescens zoea	Eupagurus pubescens		zoea		
Corbula crassa male adult	Corbula crassa		adult	male	
Katodinium glaucum <20um	Katodinium glaucum				20um



verbatimIdentification



Name as provided	scientificName	identificationQualifier	taxonRemarks
Cladocera/Ostracoda	Crustacea	Cladocera/Ostracoda	
Gadus cfr. morhua	Gadus	cfr. morhua	
Mesozooplankton	Animalia		Mesozooplankton
Gadus morhua / macrocephalus	Gadus	morhua / macrocephalus	

# Taxonomic standardization

## WoRMS Taxon Match

### ≡ WoRMS Taxon Match Tool

- ≡ Prepare file (Plain text [TXT], Comma Separated [CSV] & Excel Sheet [XLS, XLSX])
- ≡ For convenience => name the column with the cleaned name “Scientific\_name” or “ScientificName”
- ≡ Upload onto website

```
taxon_match_test - Notepad
File Edit Format View Help
Scientific_name
Solea solea
Atylus sp
Atylus larvae
Atylus nonsense
Buccinum fusiforme
Schottera nicaeënsis
Glycera convulata
Phoronis mülleri Selys-Longschamps
Atylus swammerdamei
Ocenebra erinacea
Gammarus finnmarkius Dahl, 1938
Harmothoe frazer-thompsoni McIntosh, 1897
```



### WoRMS Taxon match

Preview for the file 'taxon\_match\_test.txt' (first 20 records) [\[new match\]](#)  
Please select a WoRMS term that corresponds to your column and click 'Match'.

ScientificName

Scientific\_name

Solea solea

Atylus sp

Atylus larvae

Atylus nonsense

Buccinum fusiforme

Schottera nicaeënsis

Glycera convulata

Phoronis mülleri Selys-Longschamps

Atylus swammerdamei

Ocenebra erinacea

Gammarus finnmarkius Dahl, 1938

Harmothoe frazer-thompsoni McIntosh, 1897

[\[options\]](#) [\[preview\]](#)

< Back

Match

# Taxonomic standardization

## WoRMS Taxon Match

≡ Taxon match returns not only exact matches, also approximate matches

### WoRMS Taxon match

Match preview for the file 'taxon\_match\_test.xlsx' - matching: 84.21% [[new match](#)]  
If available, please select the [WoRMS](#) taxon that corresponds to your taxon. Then click 'Download'.

ScientificName	WoRMS match
Solea solea	Solea solea (Linnaeus, 1758)
Atylus sp	Atylus Leach, 1815
Atylus larvae	Atylus Leach, 1815
Atylus nonsense	(none)
Schottera nicaeensis	Schottera nicaeensis (J.V.Lamouroux ex Duby) Guiry & Hollenberg, 1975
Phoronis mülleri Selys-Longchamps	Phoronis muelleri Selys-Longchamps, 1903
Atylus swammerdamei	Atylus swammerdamei (H. Milne Edwards, 1830) accepted as Nototropis swammerdamei
Ocenebra erinacea	Ocenebra erinaceus (Linnaeus, 1758)
Gammarus finnmarchius Dahl, 1938	Gammarus finmarchicus Dahl, 1938 accepted as Echinogammarus incerta
Harmothoe frazer-thompsoni	Harmothoe fraserthomsoni McIntosh, 1897
Cuculus varius	Cucullus vicarius Röding, 1798 accepted as Conus locumtenens Blumenbach
Corbula crassa	Corbula crassa Reeve, 1843 accepted as Corbula ovalina Lamarck, 1818
Typhis montfortii	Typhis montfortii A. Adams, 1863 accepted as Monstrotypis montfortii (A. Adams)
Labidodemas leucopus	Labidodemas leucopus Haacke, 1880 accepted as Holothuria (Mertensiothuria) hilla Lesson, 1830
Holothuria (Mertensiothuria) hilla	Holothuria (Mertensiothuria) hilla Lesson, 1830

☐ Excel sheet (XLS)
 ☒ Excel sheet (XLSX)
 ☐ Text file
 ☐ SGML

[< Back](#)
[Download](#)

# Taxonomic standardization

## WoRMS Taxon Match

≡ Taxon match returns not only exact matches, also approximate matches

	A	B	C	D	E	F	G
1	ScientificName	AphiaID	Match type	LSID	TSN	Qualitystatus	Taxon status
2	Solea solea	127160	exact	urn:lsid:marinespecies.org:taxname:127160	173002	Checked by Taxonomic Editor	accepted
3	Atylus sp	101497	exact	urn:lsid:marinespecies.org:taxname:101497	93514	Checked by Taxonomic Editor	accepted
4	Atylus larvae	101497	exact	urn:lsid:marinespecies.org:taxname:101497	93514	Checked by Taxonomic Editor	accepted
5	Atylus nonsense						
6	Schottera nicae	494793	exact	urn:lsid:marinespecies.org:taxname:494793		Checked by Taxonomic Editor	unaccepted
7	Glycera convulata	155109	exact	urn:lsid:marinespecies.org:taxname:155109		Added by Database Management Team	unaccepted
8	Phoronis m	128549	phonetic	urn:lsid:marinespecies.org:taxname:128549	206663	Checked by Taxonomic Editor	accepted
9	Atylus swammerdamei	102131	phonetic	urn:lsid:marinespecies.org:taxname:102131	93523	Checked by Taxonomic Editor	accepted
10	Ocenebra erinacea	140405	near_1	urn:lsid:marinespecies.org:taxname:140405	73249	Checked by Taxonomic Editor	accepted
11	Gammarus finmarchius Dahl, 1938	102277	near_2	urn:lsid:marinespecies.org:taxname:102277	206449	Checked by Taxonomic Editor	accepted
12	Harmothoe frazer-thompsoni McIntosh, 1897	130764	near_2	urn:lsid:marinespecies.org:taxname:130764	64526	Checked by Taxonomic Editor	accepted

	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	ScientificName	Authority	AphiaID	ScientificName_accepted	Kingdom	Phylum	Class	Order	Family	Genus	Species	Citation	
2	Solea solea	(Linnaeus, 1758)	127160	Solea solea	Animalia	Chordata	Actinopterygii	Pleuronect	Soleidae	Solea	solea	Bailey, N. (2011). Sole	
3	Atylus	Leach, 1815	101497	Atylus	Animalia	Arthropoda	Malacostraca	Amphipod	Atylidae	Atylus		Lowry, J.; De Broyer,	
4	Atylus	Leach, 1815	101497	Atylus	Animalia	Arthropoda	Malacostraca	Amphipod	Atylidae	Atylus		Lowry, J.; De Broyer,	
5													
6	Schottera nicaeensis	(J.V.Lamouroux ex	145666	Schottera nicaeensis	Plantae	Rhodophyta	Florideophyceae	Gigartinales	Phyllophor	Schottera	nicaeensis	Guiry, M.D. (2011). Si	
7	Glycera convulata		130120	Glycera convulata	Animalia	Annelida	Polychaeta	Phyllodoce	Glyceridae	Glycera	convulata	WoRMS (2010). Glyc	
8	Phoronis muelleri	Selys-Lonchamps,	128549	Phoronis muelleri	Animalia	Phoronida				Phoronis	muelleri	Emig, C. (2011). Phor	
9	Atylus swammerdami	(Milne-Edwards, 18	102131	Atylus swammerdami	Animalia	Arthropoda	Malacostraca	Amphipod	Atylidae	Atylus	swammerdami	Costello, M.; Bellan-S	
10	Ocenebra erinaceus	(Linnaeus, 1758)	140405	Ocenebra erinaceus	Animalia	Mollusca	Gastropoda	Neogastrop	Muricidae	Ocenebra	erinaceus	Houart, R.; Gofas, S.	
11	Gammarus finmarchicus	Dahl, 1938	102277	Gammarus finmarchicus	Animalia	Arthropoda	Malacostraca	Amphipod	Gammarid	Gammarus	finmarchicus	Costello, M.; Bellan-S	
12	Harmothoe fraserthomsoni	McIntosh, 1897	130764	Harmothoe fraserthomsoni	Animalia	Annelida	Polychaeta	Phyllodoce	Polynoidae	Harmothoe	fraserthomsoni	Fauchald, K.; Barnich	



# Taxonomic standardization

## WoRMS Taxon Match

≡ Taxon match returns not only exact matches, also approximate matches

≡ WoRMS taxon match results:

- ≡ exact: all characters match exactly
- ≡ exact\_subgenus: an exact match, but including the subgenus
- ≡ phonetic: sounds similar as, despite minor differences in spelling (soundex algorithm)
- ≡ near\_1: perfect match, except for one character. This is a quite reliable match.
- ≡ near\_2: good match, except for two characters. This needs an extra check.
- ≡ near\_3: good match, except for three characters. This definitely needs an extra check.
- ≡ match\_quarantine: match with a name that is currently in quarantine. Any name that has been used in the literature should in principle not be quarantined. So best to contact the WoRMS DMT about this.
- ≡ match\_deleted: this is a match with a name that has been deleted and no alternative is available. Please contact the WoRMS DMT when you come across this.
- ≡ No match

≡ → Check and verify everything that is not an exact match...

# Taxonomic standardization

## WoRMS Taxon Match

### ≡ No match found

- ≡ Check if name was entered correctly
- ≡ Check if valid name → match with other registers:
  - ≡ LifeWatch taxon match  
<https://www.lifewatch.be/data-services/>
- ≡ Check if the taxon is marine → lookup environment on IRMNG (<https://www.irmng.org/>)
  - ≡ Marine taxon: contact WoRMS DMT
  - ≡ Non-marine taxon:
    - ≡ Misidentification?
    - ≡ Not non-marine: contact WoRMS DMT

### WoRMS Taxon match

Match preview for the file 'taxon\_match\_test.xlsx' - matching: 84.21% [\[new match\]](#)  
If available, please select the [WoRMS](#) taxon that corresponds to your taxon. Then click 'Download'.

ScientificName	WoRMS match
Solea solea	<a href="#">Solea solea (Linnaeus, 1758)</a>
Atylus sp	<a href="#">Atylus Leach, 1815</a>
Atylus larvae	<a href="#">Atylus Leach, 1815</a>
Atylus nonsense	(none)
Schottera nicaeensis	<a href="#">Schottera nicaeensis (J.V.Lamouroux ex Duby) Guiry &amp; Hollenberg, 1975</a>
Phoronis mülleri Selys-Longchamps	<a href="#">Phoronis muelleri Selys-Longchamps, 1903</a>
Atylus swammerdamei	<a href="#">Atylus swammerdamei (H. Milne Edwards, 1830) accepted as Nototropis sv</a>
Ocenebra erinacea	<a href="#">Ocenebra erinaceus (Linnaeus, 1758)</a>
Gammarus finnmarchius Dahl, 1938	<a href="#">Gammarus finnmarchicus Dahl, 1938 accepted as Echinogammarus incerta</a>
Harmothoe frazer-thompsoni	<a href="#">Harmothoe fraserthompsoni McIntosh, 1897</a>
Cuculus varius	<a href="#">Cucullus vicarius Röding, 1798 accepted as Conus locumtenens Blumenb</a>
Corbula crassa	<a href="#">Corbula crassa Reeve, 1843 accepted as Corbula ovalina Lamarck, 1818</a>
Typhis montfortii	<a href="#">Typhis montfortii A. Adams, 1863 accepted as Monstrotaphis montfortii (A.</a>
Labidodemas leucopus	<a href="#">Labidodemas leucopus Haacke, 1880 accepted as Holothuria (Mertensioth</a>
Holothuria (Mertensiothuria) hilla	<a href="#">Holothuria (Mertensiothuria) hilla Lesson, 1830</a>

☐ Excel sheet (XLS) ☒ Excel sheet (XLSX) ☐ Text file ☐ SGML

[< Back](#) [Download](#)

# Taxonomic standardization

## WoRMS Taxon Match

≡ Ambiguous matches (=multiple possible matches)

### WoRMS Taxon match

Match preview for the file 'taxon\_match\_test.txt' - matching: 91.67% [\[new match\]](#)

If available, please select the [WoRMS](#) taxon that corresponds to [your](#) taxon. Then click 'Download'.

ScientificName	WoRMS match
Solea solea	<a href="#">Solea solea (Linnaeus, 1758)</a>
Atylus sp	<a href="#">Atylus Leach, 1815</a>
Atylus larvae	<a href="#">Atylus Leach, 1815</a>
Atylus nonsense	(none)
Buccinum fusiforme	(ambiguous - select below)
Schottera nicaeensis	(ambiguous - select below)
Glycera convulata	<a href="#">Buccinum fusiforme Kiener, 1834 accepted as Buccinum humphreysianum Bennett, 1824 [exact]</a>
Phoronis mülleri Selys-Longschamps	<a href="#">Buccinum fusiforme Broderip, 1830 accepted as Turrisipho fenestratus (W. Turton, 1834) [exact]</a>
Atylus swammerdamei	<a href="#">Atylus swammerdamei (H. Milne Edwards, 1830) accepted as Nototropis swammerdamei</a>
Ocenebra erinacea	<a href="#">Ocenebra erinaceus (Linnaeus, 1758)</a>
Gammarus finmarchius Dahl, 1938	<a href="#">Gammarus finmarchicus Dahl, 1938 accepted as Echinogammarus incertae sedis finmarchicus</a>
Harmothoe frazer-thompsoni McIntosh, 1897	<a href="#">Harmothoe fraserthomsoni McIntosh, 1897</a>

☐ Excel sheet (XLS)
 ☐ Excel sheet (XLSX)
 ☒ Text file
 ☐ SGML

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# Taxonomic standardization

## WoRMS Taxon Match

≡ Ambiguous matches (=multiple possible matches)

≡ Check authority

≡ Check classification

*Chondracanthus* Kützing, 1843  
Kingdom Plantae (Rhodophyta)



*Chondracanthus* Delaroche, 1811  
Kingdom Animalia (Crustacea)





# Taxonomic standardization

## WoRMS Taxon Match

≡ Ambiguous matches (=multiple possible matches)

≡ Check authority

≡ Check classification

≡ After resolving ambiguous matches

→ download results

### WoRMS Taxon match

Match preview for the file 'taxon\_match\_test.txt' - matching: 91.67% [\[new match\]](#)  
If available, please select the [WoRMS](#) taxon that corresponds to [your](#) taxon. Then click 'Download'.

ScientificName	WoRMS match
Solea solea	<a href="#">Solea solea (Linnaeus, 1758)</a>
Atylus sp	<a href="#">Atylus Leach, 1815</a>
Atylus larvae	<a href="#">Atylus Leach, 1815</a>
Atylus nonsense	(none)
Buccinum fusiforme	(ambiguous - select below)
Schottera nicaeensis	(ambiguous - select below)
Glycera convulata	<a href="#">Buccinum fusiforme Kiener, 1834 accepted as Buccinum humphreysianum Bennett, 1824 [exact]</a>
Phoronis mülleri Selys-Longschamps	<a href="#">Buccinum fusiforme Broderip, 1830 accepted as Turrisipho fenestratus (W. Turton, 1834) [exact]</a>
Atylus swammerdamei	<a href="#">Atylus swammerdamei (H. Milne Edwards, 1830) accepted as Nototropis swammerdamei</a>
Ocenebra erinacea	<a href="#">Ocenebra erinaceus (Linnaeus, 1758)</a>
Gammarus finmarchius Dahl, 1938	<a href="#">Gammarus finmarchicus Dahl, 1938 accepted as Echinogammarus incertae sedis finmarchicus</a>
Harmothoe frazer-thompsoni McIntosh, 1897	<a href="#">Harmothoe fraserthomsoni McIntosh, 1897</a>

☐ Excel sheet (XLS) ☐ Excel sheet (XLSX) ☒ Text file ☐ SGML

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# Taxonomic standardization

## WoRMS Taxon Match

	A	B	C	D	E	F	G
1	ScientificName	AphiaID	Match type	LSID	TSN	Qualitystatus	Taxon status
2	Solea solea	127160	exact	urn:lsid:marinespecies.org:taxname:127160	173002	Checked by Taxonomic Editor	accepted
3	Atylus sp	101497	exact	urn:lsid:marinespecies.org:taxname:101497	93514	Checked by Taxonomic Editor	accepted
4	Atylus larvae	101497	exact	urn:lsid:marinespecies.org:taxname:101497	93514	Checked by Taxonomic Editor	accepted
5	Atylus nonsense						
6	Schottera nicae	494793	exact	urn:lsid:marinespecies.org:taxname:494793		Checked by Taxonomic Editor	unaccepted
7	Glycera convulata	155109	exact	urn:lsid:marinespecies.org:taxname:155109		Added by Database Management Team	unaccepted
8	Phoronis m	128549	phonetic	urn:lsid:marinespecies.org:taxname:128549	206663	Checked by Taxonomic Editor	accepted
9	Atylus swammerdamei	102131	phonetic	urn:lsid:marinespecies.org:taxname:102131	93523	Checked by Taxonomic Editor	accepted
10	Ocenebra erinacea	140405	near_1	urn:lsid:marinespecies.org:taxname:140405	73249	Checked by Taxonomic Editor	accepted
11	Gammarus finnmarchius Dahl, 1938	102277	near_2	urn:lsid:marinespecies.org:taxname:102277	206449	Checked by Taxonomic Editor	accepted
12	Harmothoe frazer-thompsoni McIntosh, 1897	130764	near_2	urn:lsid:marinespecies.org:taxname:130764	64526	Checked by Taxonomic Editor	accepted

≡ **LSID** → DwC field **scientificNameID**

# Taxonomic standardization

## WoRMS Taxon Match

	A	B	C	D	E	F	G
1	ScientificName	AphiaID	Match type	LSID	TSN	Qualitystatus	Taxon status
2	Solea solea	127160	exact	urn:lsid:marinespecies.org:taxname:127160	173002	Checked by Taxonomic Editor	accepted
3	Atylus sp	101497	exact	urn:lsid:marinespecies.org:taxname:101497	93514	Checked by Taxonomic Editor	accepted
4	Atylus larvae	101497	exact	urn:lsid:marinespecies.org:taxname:101497	93514	Checked by Taxonomic Editor	accepted
5	Atylus nonsense						
6	Schottera nicae	494793	exact	urn:lsid:marinespecies.org:taxname:494793		Checked by Taxonomic Editor	unaccepted
7	Glycera convulata	155109	exact	urn:lsid:marinespecies.org:taxname:155109		Added by Database Management Team	unaccepted
8	Phoronis m	128549	phonetic	urn:lsid:marinespecies.org:taxname:128549	206663	Checked by Taxonomic Editor	accepted
9	Atylus swammerdamei	102131	phonetic	urn:lsid:marinespecies.org:taxname:102131	93523	Checked by Taxonomic Editor	accepted
10	Ocenebra erinacea	140405	near_1	urn:lsid:marinespecies.org:taxname:140405	73249	Checked by Taxonomic Editor	accepted
11	Gammarus finmarchius Dahl, 1938	102277	near_2	urn:lsid:marinespecies.org:taxname:102277	206449	Checked by Taxonomic Editor	accepted
12	Harmothoe frazer-thompsoni McIntosh, 1897	130764	near_2	urn:lsid:marinespecies.org:taxname:130764	64526	Checked by Taxonomic Editor	accepted

≡ **LSID of the originally documented name, not the accepted name**  
→ DwC field **scientificNameID**

	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	ScientificName	Authority	AphiaID	ScientificName_accepted	Kingdom	Phylum	Class	Order	Family	Genus	Species	Citation	
2	Solea solea	(Linnaeus, 1758)	127160	Solea solea	Animalia	Chordata	Actinopterygii	Pleuronect	Soleidae	Solea	solea	Bailey, N. (2011). Sole	
3	Atylus	Leach, 1815	101497	Atylus	Animalia	Arthropoda	Malacostraca	Amphipoda	Atylidae	Atylus		Lowry, J.; De Broyer,	
4	Atylus	Leach, 1815	101497	Atylus	Animalia	Arthropoda	Malacostraca	Amphipoda	Atylidae	Atylus		Lowry, J.; De Broyer,	
5													
6	Schottera nicaeensis	(J.V.Lamouroux ex	145666	Schottera nicaeensis	Plantae	Rhodophyta	Florideophyceae	Gigartinales	Phyllophor	Schottera	nicaeensis	Guiry, M.D. (2011). S	
7	Glycera convulata		130120	Glycera convulata	Animalia	Annelida	Polychaeta	Phyllodoce	Glyceridae	Glycera	convulata	WoRMS (2010). Glyc	
8	Phoronis muelleri	Selys-Lonchamps,	128549	Phoronis muelleri	Animalia	Phoronida				Phoronis	muelleri	Emig, C. (2011). Phor	
9	Atylus swammerdami	(Milne-Edwards, 18	102131	Atylus swammerdami	Animalia	Arthropoda	Malacostraca	Amphipoda	Atylidae	Atylus	swammerdami	Costello, M.; Bellan-S	
10	Ocenebra erinaceus	(Linnaeus, 1758)	140405	Ocenebra erinaceus	Animalia	Mollusca	Gastropoda	Neogastrop	Muricidae	Ocenebra	erinaceus	Houart, R.; Gofas, S.	
11	Gammarus finmarchicus	Dahl, 1938	102277	Gammarus finmarchicus	Animalia	Arthropoda	Malacostraca	Amphipoda	Gammarid	Gammarus	finmarchicus	Costello, M.; Bellan-S	
12	Harmothoe fraserthomsoni	McIntosh, 1897	130764	Harmothoe fraserthomsoni	Animalia	Annelida	Polychaeta	Phyllodoce	Polynoidae	Harmothoe	fraserthomsoni	Fauchald, K.; Barnich	

# Value standardization

- ≡ How to standardize depends on the field
- ≡ Let's look into more detail into:
  - ≡ Taxonomy
  - ≡ **Geography**
  - ≡ Time



# Geographic standardization

## Coordinates

Different spatial reference systems

OBIS:

Decimal degrees

EPSG:4326 (WGS84)

### geodeticDatum

Identifier <http://rs.tdwg.org/dwc/terms/geodeticDatum>

Definition The ellipsoid, geodetic datum, or spatial reference system (SRS) upon which the geographic coordinates given in dwc:decimalLatitude and dwc:decimalLongitude are based.

Comments Recommended best practice is to use the EPSG code of the SRS, if known. Otherwise use a controlled vocabulary for the name or code of the geodetic datum, if known. Otherwise use a controlled vocabulary for the name or code of the ellipsoid, if known. If none of these is known, use the value **unknown**. This term has an equivalent in the dwciri: namespace that allows only an IRI as a value, whereas this term allows for any string literal value.

### Examples

EPSG:4326

WGS84

NAD27

Campo Inchauspe

European 1950

Clarke 1866

unknown

# Geographic standardization

Coordinates

Names



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## Marine Gazetteer Search results

Your search for 'north sea' returned 25 matching records

[Belgian part of the North Sea](#) (Marine Region) ⚠️ *has preferred alternative* [Belgian Exclusive Economic Zone](#)  
[Central North Sea](#) (General Sea Area)  
[Danish part of the North Sea](#) (Marine Region)  
[Dutch part of the North Sea](#) (Marine Region) ⚠️ *has preferred alternative* [Dutch Exclusive Economic Zone](#)  
[EMODnet-Biology reporting area North Sea](#) (EMODnet Biology Reporting Areas)  
[French part of Greater North Sea](#) (MSFD Marine subregions)  
[French part of the North Sea](#) (Marine Region)  
[German part of the North Sea](#) (Marine Region)  
[Greater North Sea](#) (ICES Ecoregion)  
[Greater North Sea incl. the Kattegat and the English Channel](#) (MSFD Marine subregions)  
[North Sea](#) (IHO Sea Area)  
[North Sea](#) (Large Marine Ecosystem) ⚠️ *has preferred alternative* [North Sea](#)  
[North Sea](#) (Marine Ecoregion of the World (MEOW)) ⚠️ *has preferred alternative* [North Sea](#)  
[North Sea](#) (ICES Ecoregion) ❌ *replaced by* [Greater North Sea](#)  
[North Sea](#) (SeaVoX SeaArea - level 3) ⚠️ *has preferred alternative* [North Sea](#)  
[North Sea](#) (SeaVoX SeaArea - sub-region) ⚠️ *has preferred alternative* [North Sea](#)  
[North Sea Bottom Current](#) (Current)  
[North Sea Canal](#) (Channel)  
[North Seachannel](#) (Seachannel)  
[Northern North Sea](#) (General Sea Area)  
[Northern Part of the North Sea](#) (General Sea Area)  
[Norwegian part of the North Sea](#) (Marine Region)  
[Southern Bight of the North Sea](#) (Bight)  
[Southern North Sea](#) (General Sea Area)  
[United Kingdom part of the North Sea](#) (Marine Region)



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## Marine Gazetteer Placedetails

**MRGID** <http://marineregions.org/mrgid/2350>

**Status** Proposed standard ✓

Names	Language	Name	Name source
English	North Sea	(1953). Limits of oceans and seas. 3rd edition. IHO Special Publication, 23. International Hydrographic Organization (IHO): Monaco. 38 pp. (look up in <a href="#">IMS</a> )	
Dutch	Noordzee		

**PlaceType** IHO Sea Area

**Latitude** 56° 25' 26.4" N (56.4239952°)

**Longitude** 2° 44' 16.3" E (2.73786024°)

**Precision** 711089 meter

**Min. Lat** 50° 59' 43.3" N (50.9954°)

**Min. Long** 4° 26' 43.3" W (-4.4454°)

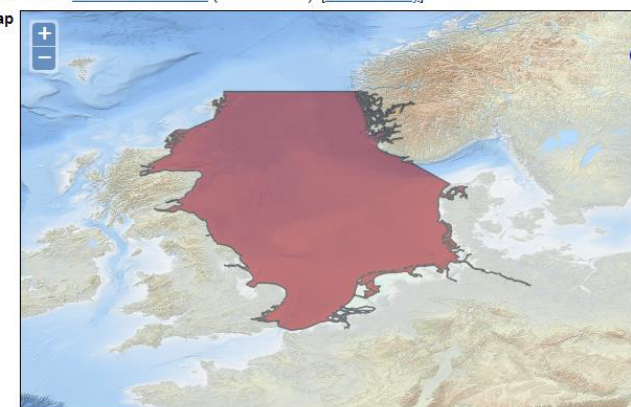
**Max. Lat** 61° 1' 1.3" N (61.017°)

**Max. Long** 12° 0' 21.4" E (12.0059°)

**Source** (1953). Limits of oceans and seas. 3rd edition. IHO Special Publication, 23. International Hydrographic Organization (IHO): Monaco. 38 pp. (look up in [IMS](#))

**Relation** Part of [North Atlantic Ocean](#) (IHO Sea Area) [\[view hierarchy\]](#)

**Map**



**Download** Layer: **MarineRegions:iho** - format: [GML3](#) [Download](#)

**Shapefile** [\[download\]](#) or view the complete IHO Sea Area shapefile

**Edit history** Last edited on 2017-01-18 17:22:03 by [De Hauwere Nathalie](#)

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# Geographic standardization

≡ Coordinates = basis of a biogeographic information system

≡ When no coordinates are provided...

≡ Derive from other location information

# Geographic standardization

## OBIS Maptool:

<https://obis.org/maptool/>

get latitude, longitude and radius for a geographic area (polygon) or a transect (line) drawn on map

Layers

Switch layers on or off. Layers from [Marine Regions](#).

EEZ boundaries

WKT

Generate WKT.

WKT

Coordinates

Add a location using decimal longitude and latitude (space or comma separated).

Add

Geocoding

Find locations by name and add them to the locations list. Geocoding by [Marine Regions](#).

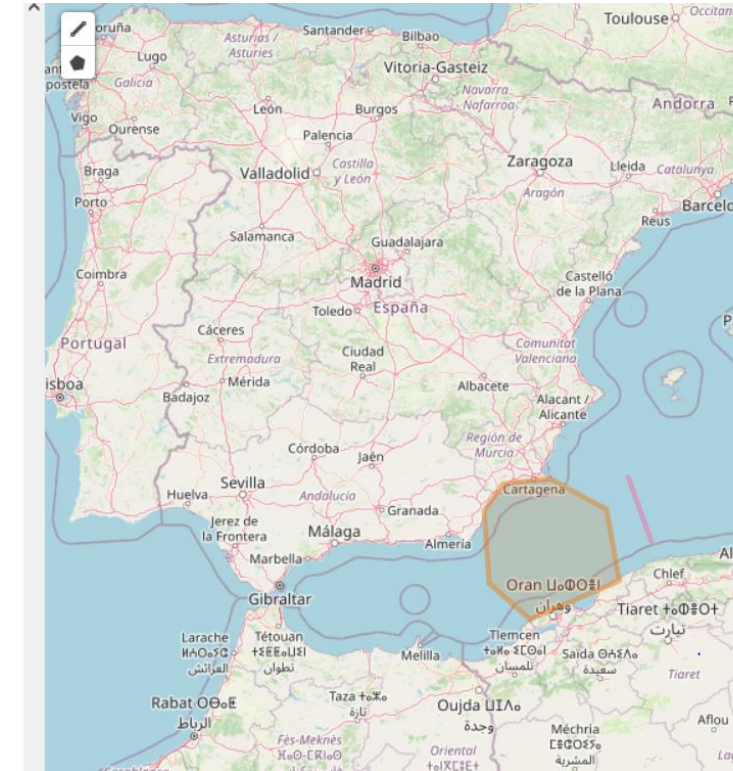
Submit

Clear

Type	Name	Longitude	Latitude	Uncertainty (m)
No results				

Locations

	Longitude	Latitude	Radius (m)	Name	Shore distance (m)	Depth (m)
<input type="checkbox"/>	-0.8752	36.7841	138,200			<div>✕</div>
<input type="checkbox"/>	0.8361	37.1767	51,725			<div>✕</div>





# Geographic standardization

## OBIS Maptool:

<https://obis.org/maptool/>

get latitude, longitude and radius for a geographic area (polygon) or a transect (line) drawn on map

Shape → footprintWKT

Layers

Switch layers on or off. Layers from [Marine Regions](#).

EEZ boundaries

WKT

Generate WKT.

WKT

Coordinates

Add a location using decimal longitude and latitude (space or comma separated).

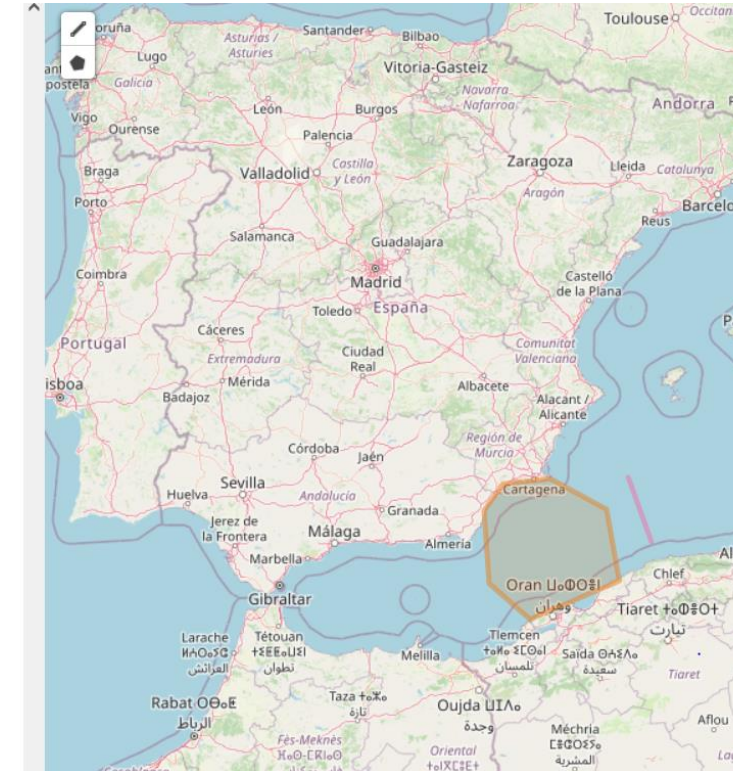
Geocoding

Find locations by name and add them to the locations list. Geocoding by [Marine Regions](#).

Type	Name	Longitude	Latitude	Uncertainty (m)
No results				

Locations

	Longitude	Latitude	Radius (m)	Name	Shore distance (m)	Depth (m)	
□	-0.8752	36.7841	138,200				✕
△	0.8361	37.1767	51,725				✕





# Geographic standardization

## OBIS Maptool:

<https://obis.org/maptool/>

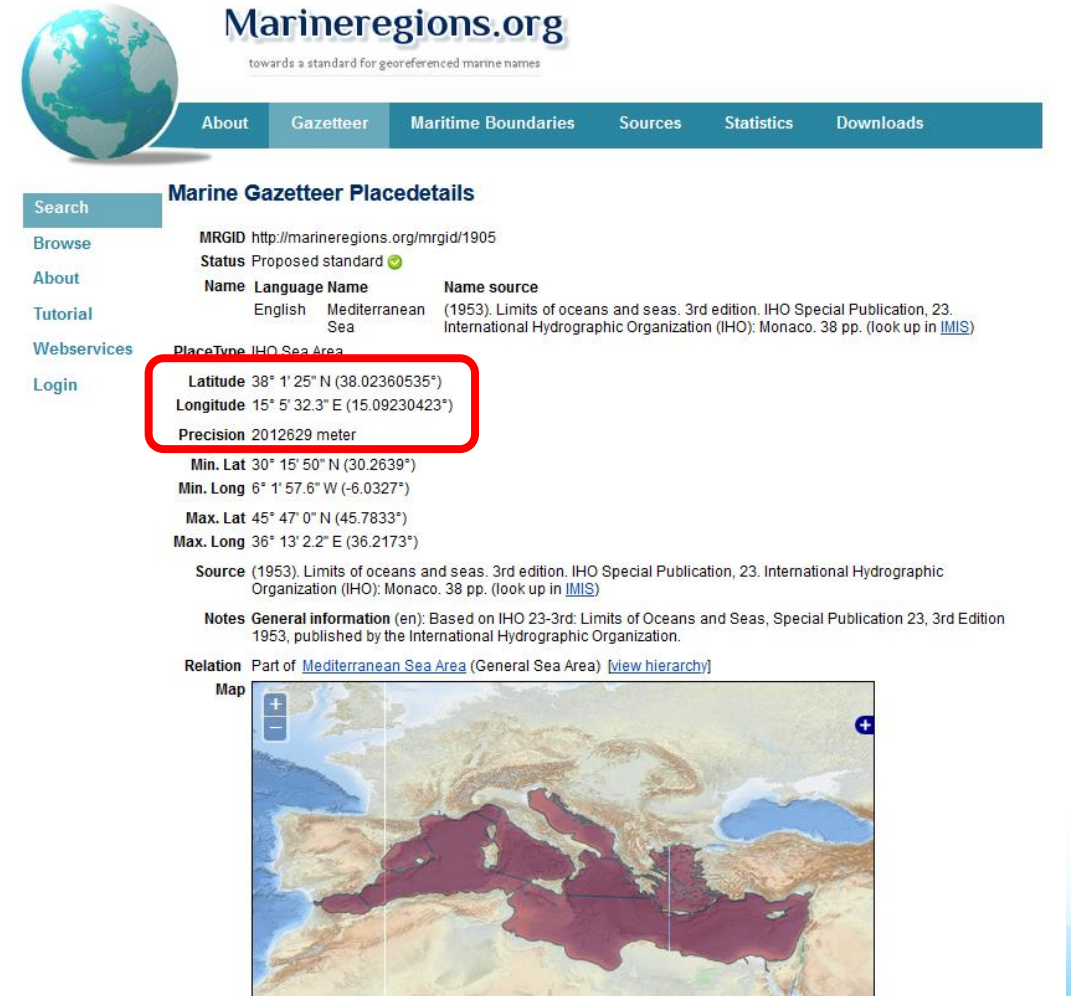
get latitude, longitude and radius **for a geographic area (polygon) or a transect (line) drawn on map**

Shape → footprintWKT

## Marine Regions Gazetteer:

<https://marineregions.org/>

get latitude, longitude and precision **based on a place name**



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**Marine Gazetteer Placedetails**

MRGID <http://marineregions.org/mrgid/1905>  
Status Proposed standard

Name	Language	Name source
English	Mediterranean Sea	(1953). Limits of oceans and seas. 3rd edition. IHO Special Publication, 23. International Hydrographic Organization (IHO): Monaco. 38 pp. (look up in <a href="#">MIS</a> )

PlaceType IHO Sea Area

**Latitude** 38° 1' 25" N (38.02360535°)  
**Longitude** 15° 5' 32.3" E (15.09230423°)  
**Precision** 2012629 meter

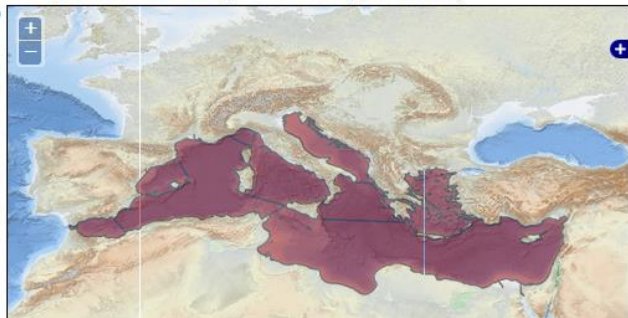
**Min. Lat** 30° 15' 50" N (30.2639°)  
**Min. Long** 6° 1' 57.6" W (-6.0327°)  
**Max. Lat** 45° 47' 0" N (45.7833°)  
**Max. Long** 36° 13' 2.2" E (36.2173°)

**Source** (1953). Limits of oceans and seas. 3rd edition. IHO Special Publication, 23. International Hydrographic Organization (IHO): Monaco. 38 pp. (look up in [MIS](#))

**Notes** **General information** (en): Based on IHO 23-3rd: Limits of Oceans and Seas, Special Publication 23, 3rd Edition 1953, published by the International Hydrographic Organization.

**Relation** Part of [Mediterranean Sea Area](#) (General Sea Area) [view hierarchy](#)

Map



# Geographic standardization

## ≡ OBIS Maptool:

<https://obis.org/maptool/>

≡ get latitude, longitude and **radius** for a geographic area (polygon) or a transect (line) drawn on map

≡ Shape → footprintWKT

## ≡ Marine Regions Gazetteer:

<https://marineregions.org/>

≡ get latitude, longitude and **precision** based on a place name

≡ Do not refer to 'uncertain' locations as points, but as areas

≡ → Include **coordinateUncertaintyInMeters** !

# Geographic standardization

≡ When no coordinates are provided...

- ≡ Derive from other location information
  - ≡ But take care! ""To georeference poorly is worse than not to georeference at all."
  - ≡ Georeferencing Best Practices:  
<https://docs.gbif.org/georeferencing-best-practices/1.0/en/>
  - ≡ Georeferencing Quick Reference Guide:  
<https://docs.gbif.org/georeferencing-quick-reference-guide/1.0/en/>

≡ Do not refer to 'uncertain' locations as points, but as areas

≡ → Include  
**coordinateUncertaintyInMeters**  
!

# Value standardization

- ≡ How to standardize depends on the field
- ≡ Let's look into more detail into:
  - ≡ Taxonomy
  - ≡ Geography
  - ≡ **Time**

# Temporal standardization

- ≡ Standard: ISO 8601-1:2019
- ≡ YYYY-MM-DD
- ≡ No timezone specified → local time
  - ≡ If UTC: add a Z at the end
- ≡ Unknown time → do not add time  
(do not use 00:00)

eventDate	
Identifier	<a href="http://rs.tdwg.org/dwc/terms/eventDate">http://rs.tdwg.org/dwc/terms/eventDate</a>
Definition	The date-time or interval during which a dwc:Event occurred. For occurrences, this is the date-time when the dwc:Event was recorded. Not suitable for a time in a geological context.
Comments	Recommended best practice is to use a date that conforms to ISO 8601-1:2019.

## ≡ Examples:

### ≡ Dates:

- ≡ 1948-09-13
- ≡ 1993-01/02
- ≡ 1993-01
- ≡ 1993

### ≡ Dates with Specific Times:

- ≡ 1973-02-28T15:25:00
- ≡ 2008-04-25T09:53

### ≡ Dates with Time Zones:

- ≡ 2005-08-31T12:11+12
- ≡ 2013-02-16T04:28Z

### ≡ Date and Time Intervals:

- ≡ 1993-01-26T04:39+12/1993-01-26T05:48+12



# Value standardization

- ≡ How to standardize depends on the field
- ≡ Let's look into more detail into:
  - ≡ Taxonomy
  - ≡ Geography
  - ≡ Time
- ≡ Measurements

lifeStage	
Identifier	<a href="http://rs.tdwg.org/dwc/iri/lifeStage">http://rs.tdwg.org/dwc/iri/lifeStage</a>
Definition	The age class or life stage of the dwc:Organism(s) at the time the dwc:Occurrence was recorded.
Comments	Recommended best practice is to use a controlled vocabulary. Terms in the dwciri namespace are intended to be used in RDF with non-literal objects.

individualCount	
Identifier	<a href="http://rs.tdwg.org/dwc/terms/individualCount">http://rs.tdwg.org/dwc/terms/individualCount</a>
Definition	The number of individuals present at the time of the dwc:Occurrence.

# Measurements standardization

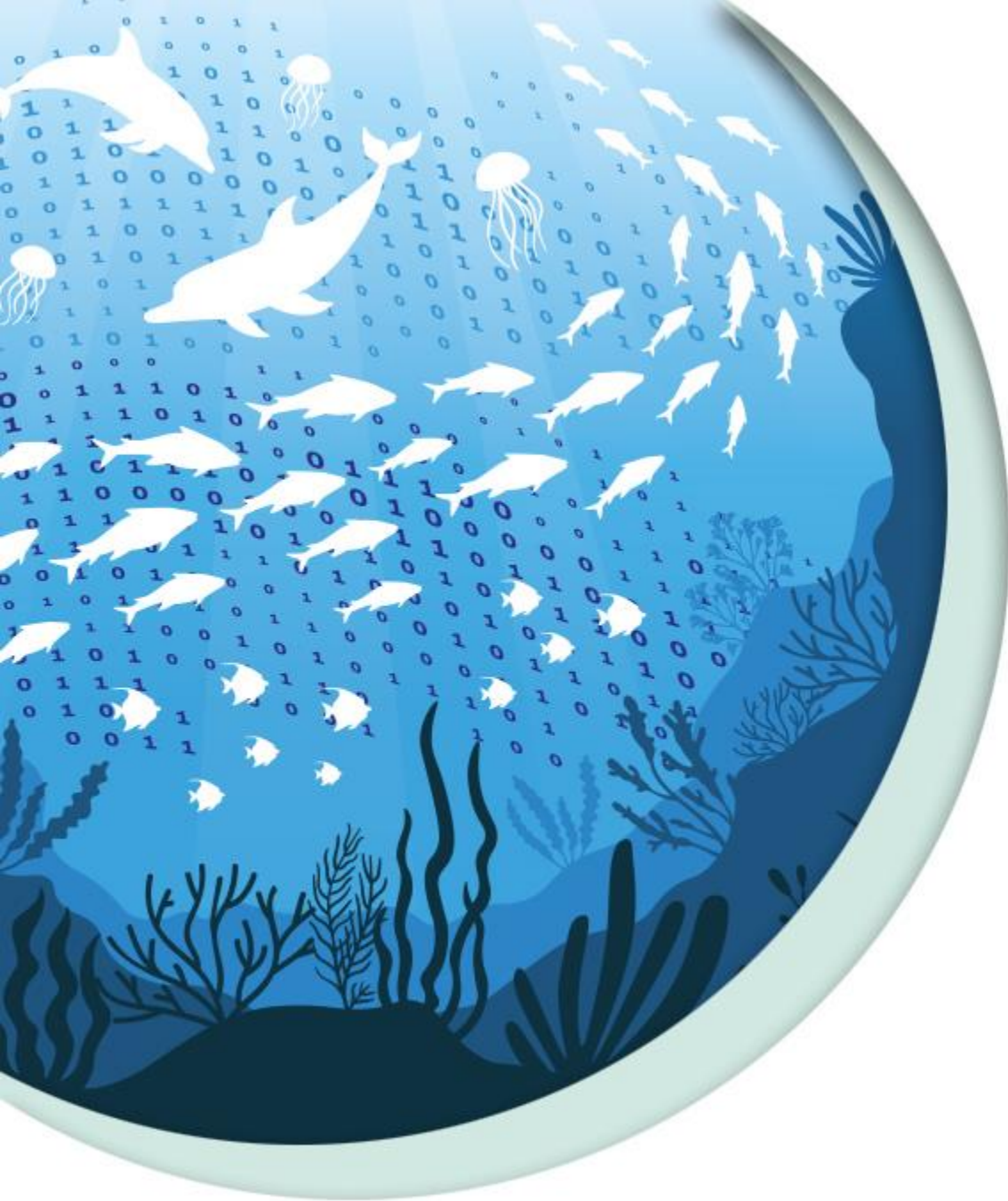
- ≡ Not all measurement types have a corresponding DwC term
- ≡ Solution → eMOF (extendedMeasurementOrFact)
- ≡ BODC NERC vocabulary
  - ≡ Standardise parameter names, units and values
- ≡ Details in the break-out session

	A	B	C	D	E	F	G	H
1	EventID	Occurrence	measurementType	measurementTypeID	measurementValue	measurementValueID	measurementUnit	measurementUnitID
2	BIOFUN1_CSIC_BIOF	Abundance of biological entity specified elsewhere per unit area of the bed		<a href="http://vocab.nerc.ac.uk/collection/P01/current/SDBIOL02/">http://vocab.nerc.ac.uk/collection/P01/current/SDBIOL02/</a>	0.00025		N/km2	<a href="http://vocab.nerc.ac.uk/collection/P06/current/NPKM/">http://vocab.nerc.ac.uk/collection/P06/current/NPKM/</a>
3	BIOFUN1_CSIC_BIOF	Count (in assayed sample) of biological entity specified elsewhere		<a href="http://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/">http://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/</a>	1			
4	BIOFUN1_CSIC_BIOF	Wet weight biomass of biological entity specified elsewhere per unit area of the bed		<a href="http://vocab.nerc.ac.uk/collection/P01/current/SDBIOL05/">http://vocab.nerc.ac.uk/collection/P01/current/SDBIOL05/</a>	0.00375		kg/km2	<a href="http://vocab.nerc.ac.uk/collection/P06/current/KGAK/">http://vocab.nerc.ac.uk/collection/P06/current/KGAK/</a>
5	BIOFUN1_CSIC_BIOF	Abundance of biological entity specified elsewhere per unit area of the bed		<a href="http://vocab.nerc.ac.uk/collection/P01/current/SDBIOL02/">http://vocab.nerc.ac.uk/collection/P01/current/SDBIOL02/</a>	0.00025		N/km2	<a href="http://vocab.nerc.ac.uk/collection/P06/current/NPKM/">http://vocab.nerc.ac.uk/collection/P06/current/NPKM/</a>
6	BIOFUN1_CSIC_BIOF	Count (in assayed sample) of biological entity specified elsewhere		<a href="http://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/">http://vocab.nerc.ac.uk/collection/P01/current/OCOUNT01/</a>	1			
7	BIOFUN1_CSIC_BIOF	Wet weight biomass of biological entity specified elsewhere per unit area of the bed		<a href="http://vocab.nerc.ac.uk/collection/P01/current/SDBIOL05/">http://vocab.nerc.ac.uk/collection/P01/current/SDBIOL05/</a>	0.00675		kg/km2	<a href="http://vocab.nerc.ac.uk/collection/P06/current/KGAK/">http://vocab.nerc.ac.uk/collection/P06/current/KGAK/</a>
8	BIOFUN1_BF1A01	Sampling device aperture length		<a href="http://vocab.nerc.ac.uk/collection/Q01/current/Q0100014/">http://vocab.nerc.ac.uk/collection/Q01/current/Q0100014/</a>	2.5		m	<a href="http://vocab.nerc.ac.uk/collection/P06/current/ULAA/">http://vocab.nerc.ac.uk/collection/P06/current/ULAA/</a>
9	BIOFUN1_BF1A01	Sampling device aperture width		<a href="http://vocab.nerc.ac.uk/collection/Q01/current/Q0100013/">http://vocab.nerc.ac.uk/collection/Q01/current/Q0100013/</a>	1.2		m	<a href="http://vocab.nerc.ac.uk/collection/P06/current/ULAA/">http://vocab.nerc.ac.uk/collection/P06/current/ULAA/</a>
10	BIOFUN1_BF1A01	Sampling instrument name		<a href="http://vocab.nerc.ac.uk/collection/Q01/current/Q0100002/">http://vocab.nerc.ac.uk/collection/Q01/current/Q0100002/</a>	Agassiz dredge		<a href="http://vocab.nerc.ac.uk/collection/L22/current/TOOL1252/">http://vocab.nerc.ac.uk/collection/L22/current/TOOL1252/</a>	
11	BIOFUN1_BF1A01	Sampling net mesh size		<a href="http://vocab.nerc.ac.uk/collection/Q01/current/Q0100015/">http://vocab.nerc.ac.uk/collection/Q01/current/Q0100015/</a>	12		mm	<a href="http://vocab.nerc.ac.uk/collection/P06/current/UXMM/">http://vocab.nerc.ac.uk/collection/P06/current/UXMM/</a>
12	BIOFUN1_BF1A01	Speed of measurement platform relative to ground surface {speed over ground}		<a href="http://vocab.nerc.ac.uk/collection/P01/current/APSAZZ01/">http://vocab.nerc.ac.uk/collection/P01/current/APSAZZ01/</a>	2		knots	<a href="http://vocab.nerc.ac.uk/collection/P06/current/UKNT/">http://vocab.nerc.ac.uk/collection/P06/current/UKNT/</a>

Example eMOF table (example from OTGA course “Contributing datasets to EMODnet Biology”)

# Resources

- ≡ <https://dwc.tdwg.org/terms/>
- ≡ [https://manual.obis.org/common\\_formatissues.html#spatial](https://manual.obis.org/common_formatissues.html#spatial)
- ≡ <https://docs.gbif.org/georeferencing-best-practices/1.0/en/>
- ≡ <https://docs.gbif.org/georeferencing-quick-reference-guide/1.0/en/>
- ≡ [https://www.marinespecies.org/tutorial\\_taxonmatch.php](https://www.marinespecies.org/tutorial_taxonmatch.php)
- ≡ [https://manual.obis.org/common\\_formatissues.html#temporal-dates-and-times](https://manual.obis.org/common_formatissues.html#temporal-dates-and-times)



# DTO-BioFlow

Integration of biodiversity monitoring  
data into the Digital Twin Ocean

THANKS!