



C. Nozères (2013)

« Ceci n'est pas un *Sebastes* sp »
'This is not a *Sebastes* sp.'

Taxonomic names – understanding sources and authorities

Claude Nozères, DFO-Quebec Region, 2022-12-13

Context can be key for names

- This came about from discussions with people
 - How are you **using** the *World Register of Marine Species*?
 - Why is **this** taxonomic name displayed on records?



Belgian artist René Magritte: *The Treachery of Images* (« Ceci n'est pas une pipe »)
https://en.wikipedia.org/wiki/The_Treachery_of_Images

Sources and Authorities

Taxonomic Concepts - context

Taxonomic Authorities - opinion

Taxonomic Frameworks - linkages

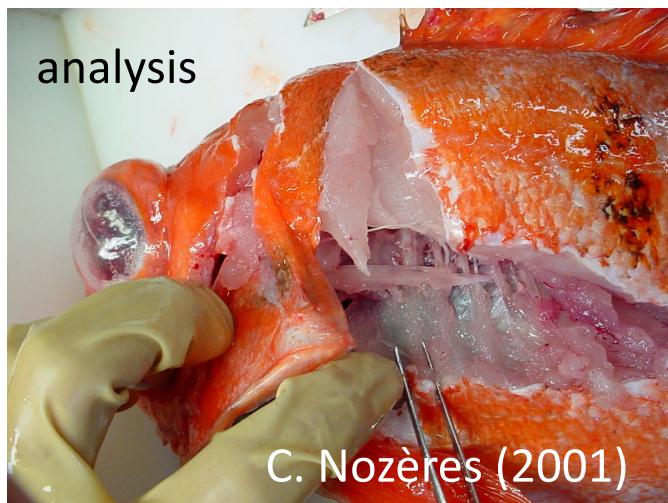
Taxonomic Concepts

- A name of an organism at a time and place
 - use an Authority to give it weight (valid/official)
 - value could depend on history and geography
- *Sebastes* sp.
 - Gulf of St. Lawrence, ca. 1950 = *Sebastes marinus*
 - Gulf of St. Lawrence, ca. 1990 = *Sebastes fasciatus*,
Sebastes mentella, *Sebastes norvegicus*
 - qualifier: **often** *mentella*, **some** *fasciatus*, usually **not** the name for captures of *norvegicus* (**synonym** = *marinus*)
 - qualifier: called **redfish** in Atlantic, but **rockfish** in Pacific
 - qualifier: possible to name species proportions in capture modelling, but not the name for an individual fish

So, what could these be named?



<https://inaturalist.ca/observations/140279234>



Sebastes, and perhaps *mentella*
- **possibly**, from photo (not *Helicolenus*)
- **likely**, from count of anal fin soft rays
- **very likely**, from dissection/genetics

So, genus *Sebastes* (but with context)



<https://inaturalist.ca/observations/135990709>

Taxonomic Authorities are citable tools – how we record with them could also be stated

Standards associated with names

- Biodiversity Information Standards <https://www.tdwg.org/>
- **DarwinCore**: defines fields for context, e.g.,
 - *scientificName*: name according to an authority
 - *scientificNameID*: international identifier of an authority
 - *verbatimIdentification*: name as recorded by a source
 - *identificationRemarks*: notes on name from a source
 - *taxonomicRemarks*: notes on name from an authority
- Annual conference (last one in Oct. 2022)
 - discuss new tools, use cases, data quality--and taxonomy
- Published in journal <https://biss.pensoft.net/>

Like Authorities , there are several Standards; DarwinCore is a major one for biodiversity

Taxonomic Authorities

- Reference Sources that present opinions on names
- **Primary:** initial authority, usually more academic
 - e.g., Eschmeyer's Catalogue of Fishes
<https://www.calacademy.org/scientists/projects/eschmeiers-catalog-of-fishes>
- **Secondary:** may be an authority and have opinion, but not necessarily the root source of a name
 - e.g., FishBase to WoRMS
 - note: Fishbase is considered 'primary' to WoRMS, and WoRMS is considered 'primary' to several, like OBIS, iNaturalist, and DFO

Authorities: WoRMS with DFO

- In 2000s, a DFO taxonomic working group began standardizing name lists to match with ITIS (Integrated Taxonomic Information System)



- was mostly for agriculture in USA (plants and insects)
 - needed for trade (reference for commercial species)

- By 2010, the marine authority adopted by DFO was WoRMS (World Register of Marine Species)

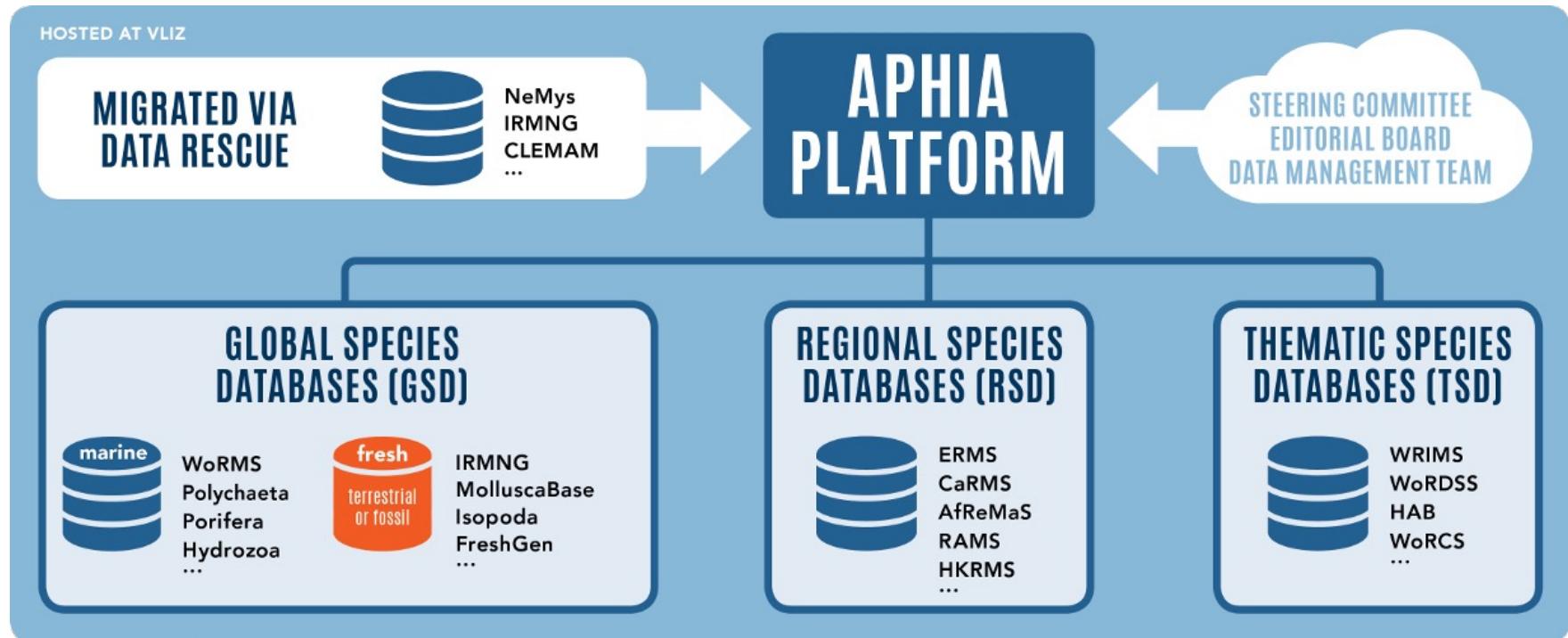


- this has a regional subset: CaRMS (Canadian Register of Marine Species), for checklists and photos
 - managed by **Mary Kennedy** (DFO-BIO, retired 2015), also Claude Nozères (mainly as a contact person)

<https://www.marinespecies.org/CaRMS/index.php>

WoRMS structure

<https://www.marinespecies.org/about.php>

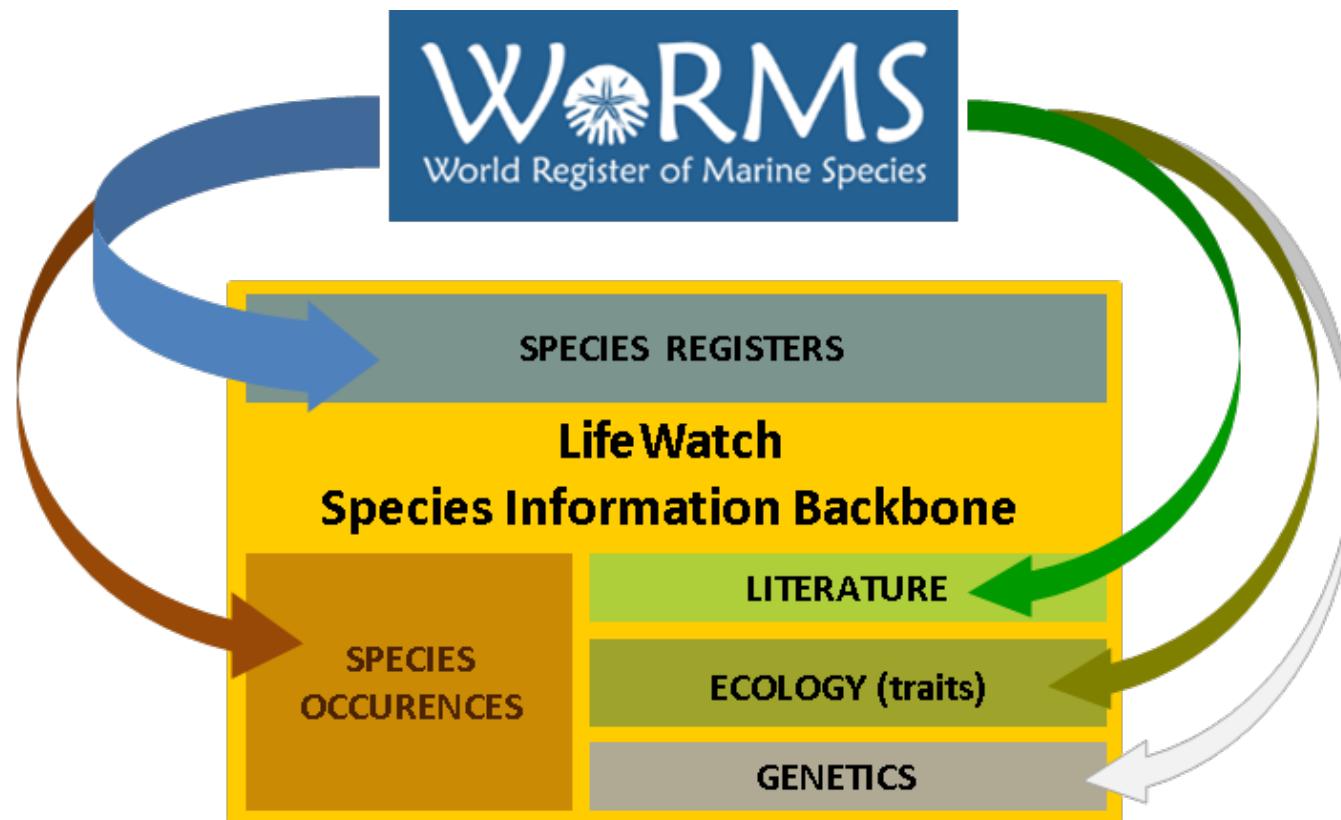


Had several projects and needs. Instead of building separately, chose to make a 'global base' that combines several root sources, and displays subsets by geography or subject.

WoRMS - Names

- Lists known versions of taxonomic names
 - if missing, will be added when given a reference
- Every spelling or taxonomic variation has a taxon page and unique sequential number (AphiaID)
 - every version/page is linked to all others
- 1 name will be preferred ('valid') over others
 - spelling changes and revisions make synonyms ('invalid')
 - sometimes 'alternate representations' are shown
- Could automatically use valid name (as does OBIS), or known synonyms (are linked to valid name)

WoRMS: names and beyond

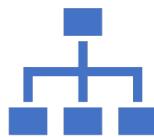


15 years on: history news capsules explaining more

<https://lifewatch.be/en/2022-news-WoRMS-15th-anniversary>

WoRMS in 2022

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



Data Management
Team (5)



Steering
Committee (12)



Editors (317)



Names: 766,910

Taxonomic Frameworks

- from iNaturalist: *information about ‘what me mean’ by a particular taxon*
https://www.inaturalist.org/pages/taxon_frameworks
 - thus, how a branch of their taxonomy links to that of another, such as from WoRMS, ITIS, or Catalogue of Life
- may be a match (one-to-one)
- or a deviation (including external—not in a source)

Frameworks in application

How names are linked from an authority to a user

- **OBIS** = WoRMS **current** names are **source** for records
- **DFO** = WoRMS is **source** for most names
- **iNaturalist** = WoRMS is a **source** of marine names
- **GBIF** = WoRMS is a **source** among others (e.g., ITIS)
- **BIIGLE (images)** = WoRMS is **the source** for taxonomy if wanted for annotations
- **BOLDsystems (genetics)** = WoRMS names have **links**

iNaturalist in 2022



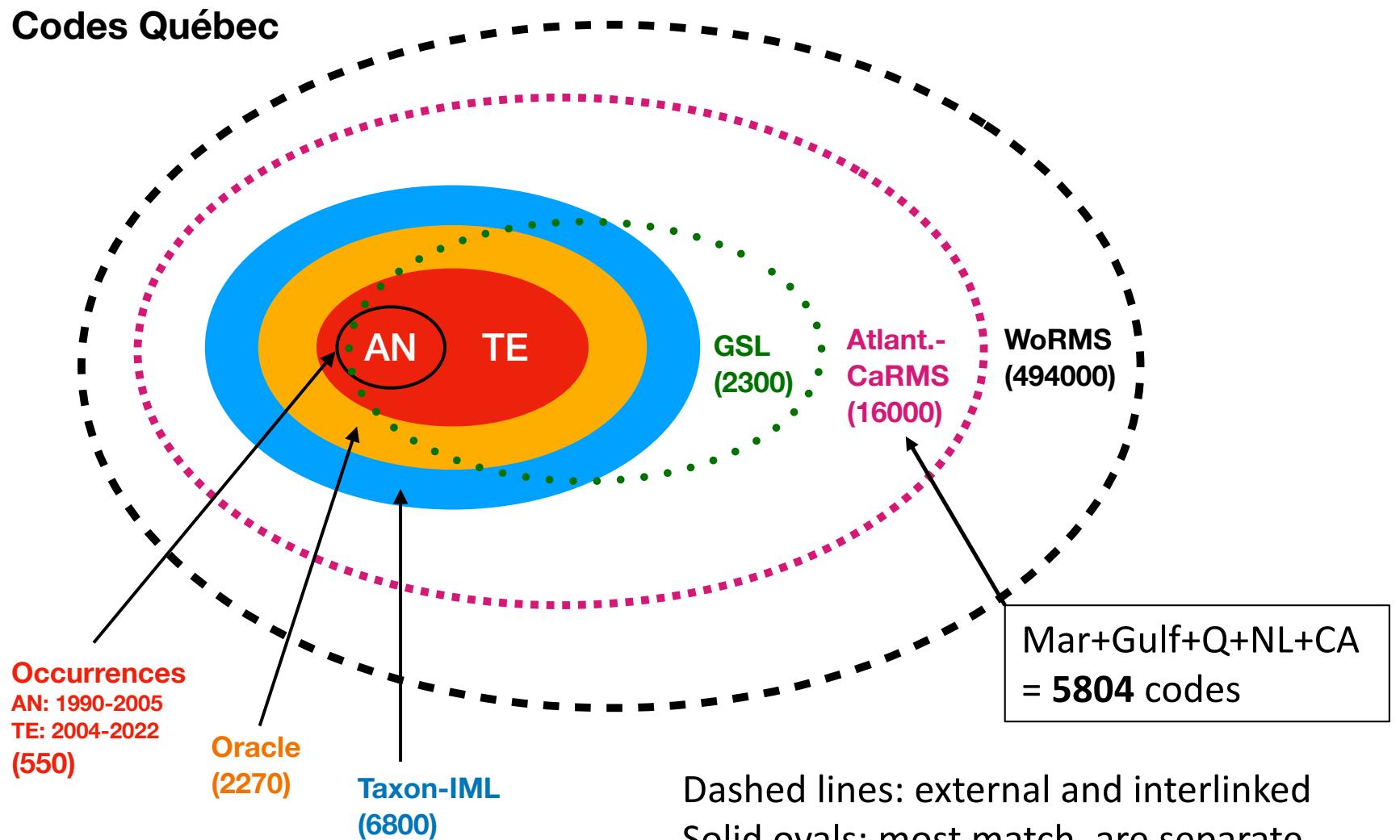
- *Users from groups with curators and managers* maintain taxonomic framework for records that are always changing with names and relationships
 - Do not ‘care’ about names (unless you want to)
- 21 groups of iNaturalist Network (e.g., iNaturalist Canada, managed by Canadian Wildlife Federation)
- 32 M observations with 46 M identifications
- 262 K species

Year in Review 2022: <https://www.inaturalist.org/stats/2022>

Sources & Names: a taxon

- Published revision in a coral (concept)
<https://ssbbulletin.org/index.php/bssb/article/view/8735>
- Revised record in WoRMS (authority)
<https://www.marinespecies.org/aphia.php?p=taxdetails&id=1608733>
- Leads to taxon swap by iNat. curators (framework)
https://inaturalist.ca/taxon_changes?taxon_id=1430593
- Changes notify users -> updates DFO record
<https://inaturalist.ca/observations/15001570>

Sources & Names: Quebec Region



Extras

Name issues: descriptive

Deepwater, arctic-only fish is widely reported in shallows of NW Atlantic



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Liparis fabricii Krøyer, 1847

Kingdom **Animalia** > Phylum **Chordata** > Subphylum **Vertebrata** > Infraphylum **Gnathostomata** > Class **Actinopteri** > Subclass **Teleostei** > Order **Perciformes** > Family **Liparidae** > Genus **Liparis** > Species **Liparis fabricii**

accepted name

Rank Species

Status accepted

Aphia ID urn:lsid:marinespecies.org:taxname:127218

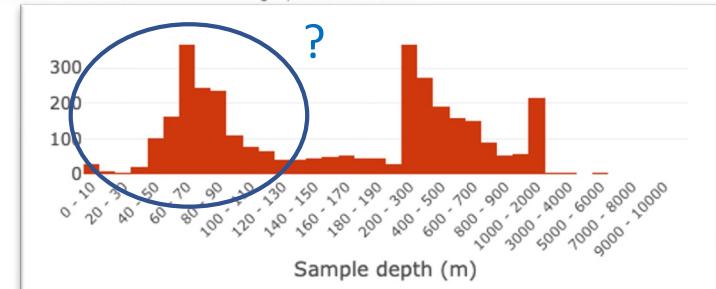
BOLD ID 71296

NCBI ID 241823

Common names gelatinous seasnail, gelatinous snailfish, limace gélaineuse, limace gélantineuse, polarringbuk, polarringbuk

Environments marine, brackish, freshwater, terrestrial

'Gelatinous seasnail'

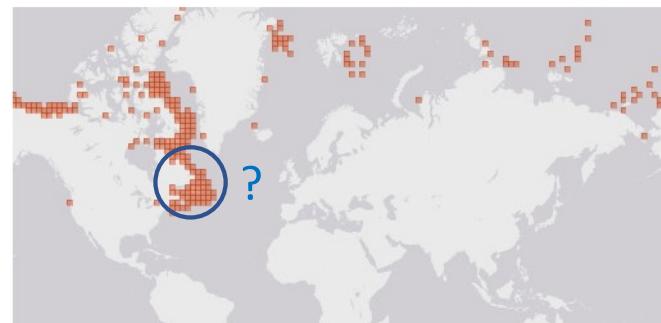


[report issue](#) [to mapper](#)

STATISTICS

Occurrence records	6,225
> Species level	6,225
Absence records	3
Species	1
Taxa	1
Datasets	32
Time range	1835 - 2019

DISTRIBUTION

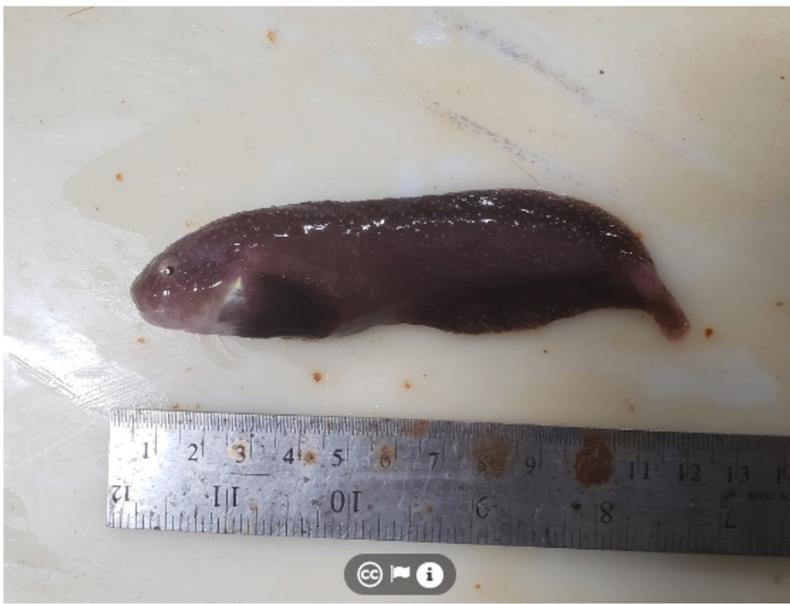


<https://obis.org/taxon/127218>

'Gelatinous seasnail'

<https://inaturalist.ca/observations/144074787>

Gelatinous Seasnail (*Liparis fabricii*) Research Grade



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477 observations

◀ ▶

Observed: Dec 10, 2022 · 9:30 AM -04:00 Submitted: Dec 10, 2022 · 9:20 AM EST



Map Satellite

Northwestern Passage
Hudson Bay
Labrador Sea
Greenland
Iceland

Google Keyboard shortcuts Map data ©2022 Google, INEGI 500 km Terms of Use

Qikiqtaaluk, NU, Canada Details ▾

Notes

Limace sp. Rare dans les chaluts à crevettes à 405 mètres de profondeur.

Community Taxon

What's this?

Gelatinous Seasnail (*Liparis fabricii*)

Confusion is likely with another kind (e.g., *Careproctus*) – photos make it obvious



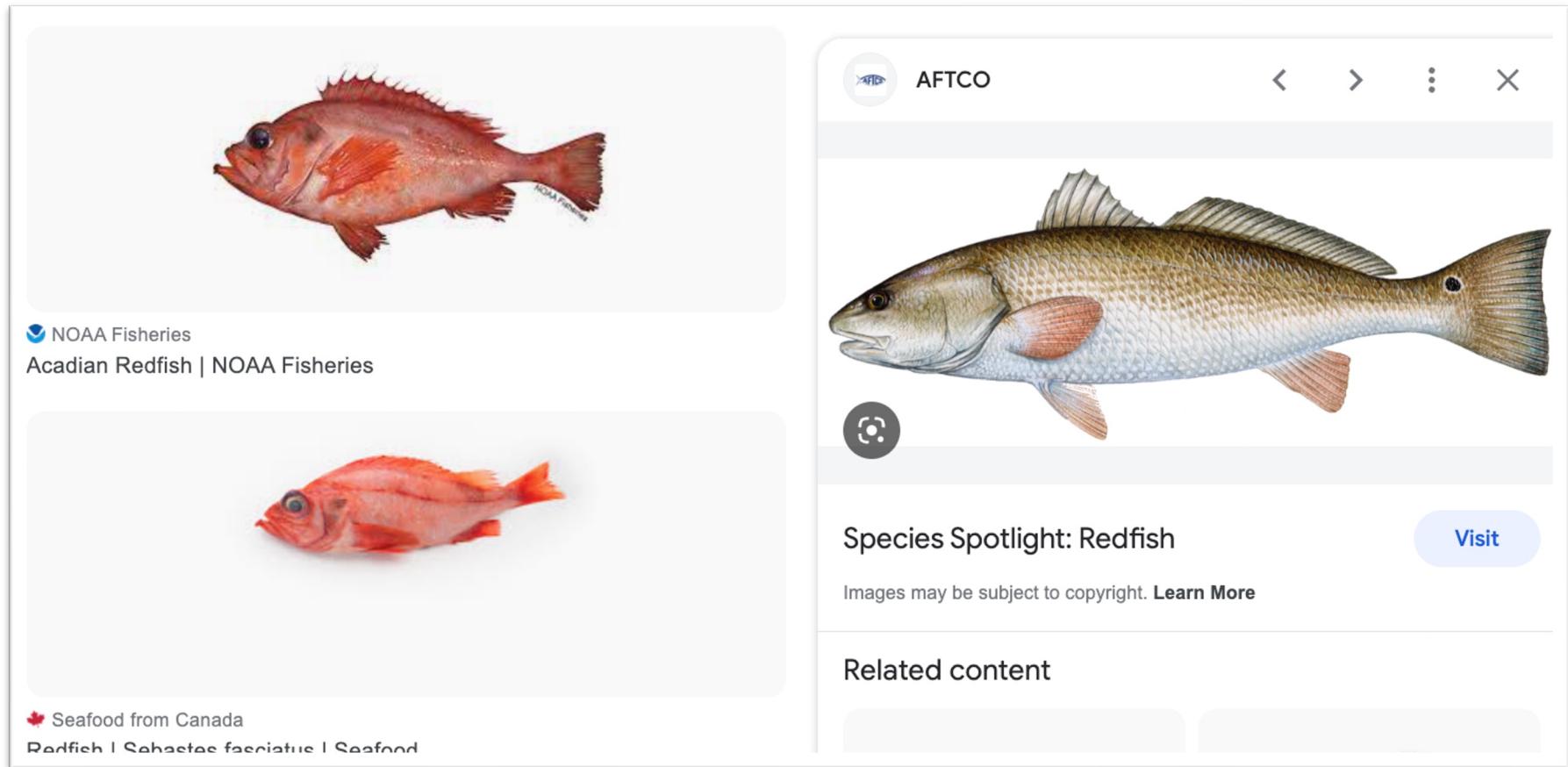
Name confusion - solutions

- DFO-Pacific Region use a **webcam** to record all sorted captures weighed on the scale
 - confirms species, and also weight values
- Vouchers for **genetics** have revealed species
 - Arctic sandlance (*Ammodytes hexapterus*) in GSL is confirmed (forgotten for decades)
 - is an Arctic-Atlantic fish but was long called ‘Pacific Sandlance’ (another species), leading to confusion about distributions and climate change when recently detected in Western Arctic

Name issues: geographical

Gulf of St. Lawrence, Gulf of Maine, Gulf of Mexico...

Doing an image search for **redfish** will get 2 kinds of results



The image shows two side-by-side illustrations of fish. On the left is a reddish-orange fish labeled 'Acadian Redfish | NOAA Fisheries'. On the right is a larger, more elongated fish with a mottled pattern of brown, tan, and white, labeled 'Species Spotlight: Redfish'.

Left Image (NOAA Fisheries):
NOAA Fisheries
Acadian Redfish | NOAA Fisheries

Right Image (AFTCO):
AFTCO
Species Spotlight: Redfish [Visit](#)
Images may be subject to copyright. [Learn More](#)

Bottom Left (Seafood from Canada):
Seafood from Canada
Redfish | *Sebastodes fasciatus* | Seafood

Redfish = *Sebastodes*, 3 sp. in NW Atlantic, or *Sciaenops ocellatus* in SE USA

Note: *Sebastodes* = **Rockfish**, globally, because Pacific has many more species

Name geography - solutions

Taxonomic Changes Taxon: *Gadus macrocephalus* (Active)"

Change types

Split Merge Swap Stage Drop

Change group

None

Taxon scheme

None

Committed

Either

Iconic taxon

any

Taxon

Pacific Cod

Ancestor Taxon

Type taxon name

Source

Type source name

Filter Clear filters

 Taxonomic Split 110883 (Committed on 2022-05-19)

See <https://www.inaturalist.org/flags/436812>

Source: CAS Catalog of Fishes (Citation)

Added by loarie on May 18, 2022 16:44 | Committed by loarie on May 19, 2022

 *Gadus macrocephalus*
180029
110 observations Active
Covered by a taxon framework for Class
Actinopterygii Sourced to Catalog of Fishes
Relationship: match

split into

 *Gadus macrocephalus*
180029
110 observations Active Atlased
Covered by a taxon framework for Class
Actinopterygii Sourced to Catalog of Fishes
Relationship: match

 *Gadus ogac* 1316214
31 observations Active Atlased
Covered by a taxon framework for Class
Actinopterygii Sourced to Catalog of Fishes
Relationship: match

 Taxonomic Swap 29536 (Committed on 2018-01-01)

Considered a synonym in Fishbase

Source: Fishbase page on *Osthorinchus* (Citation) | Group : 1_2018 Fishbase update batch 1

Move children to output? Yes

Added by loarie on January 01, 2018 20:15 | Committed by loarie on January 01, 2018

 *Gadus ogac* 220281
0 observations Inactive
Covered by a taxon framework for Class
Actinopterygii Sourced to Catalog of Fishes
Relationship: Unknown

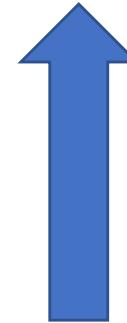
replaced with

 *Gadus macrocephalus*
180029
110 observations Active
Covered by a taxon framework for Class
Actinopterygii Sourced to Catalog of Fishes
Relationship: match

https://inaturalist.ca/taxon_changes?taxon_id=180029

Pacific Cod and Greenland Cod

Was split in 2022 based on geography



Was revised in 2018 - name swapped for another

Taxon framework relationship

Taxon Framework Relationship 588070 [View taxonomy details for *Gadus ogac*](#)

Covered by a [taxon framework for Class Actinopterygii](#) Sourced to Catalog of Fishes

Relationship: Match

Gadus — G. ogac Gadus — G. ogac

iNaturalist Canada		Catalog of Fishes
Species <i>Gadus ogac</i> (parent: Genus <i>Gadus</i>)	Match	Species <i>Gadus ogac</i> (parent: Genus <i>Gadus</i>)

Created by [loarie](#) on November 23, 2021

https://inaturalist.ca/taxon_framework_relationships/588070

Checklist Bank – make public

- <https://www.checklistbank.org/>
- WoRMS Brachyura ver. (12/2022) / 2022-12-01
 - <https://www.checklistbank.org/dataset/1108/about>
- iNat / 2022-10-01
 - <https://www.checklistbank.org/dataset/139831/about>