

The Atlantic Hydra and how to subdue it

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the Atlantic Hydra

- also known as the Species List
- one can idealistically assume that an authoritative and curated list of species exists regionally
- the Species List is known to duplicate and diverge each time a new usage case is formulated
- because of changes in species distributions and in taxonomic research, the Species List is continually evolving

Timeline of Atlantic Hydra sightings

- Appendix in [Hurlbut and Clay \(1990\)](#) states:

This file is modified from one provided in 1987 by the Marine Fish Division, St. Andrews, N.B.

- R package *gulf*
 - data frame called *species.names*, and helper functions *species.str* and *species.code*
 - assignment of AphiaID to existing list, “beautification” of common names, ...
- [Maritimes Atlas 2022](#)
- laboratory processing of stomach contents: the RV species list as a starting point?
- Andes deployment in 2022 annual ecosystem survey following merge of species lists between Quebec and Gulf

Attempts at subduing the Hydra

- an adhoc but reproducible solution : Maritimes Atlas
 - the summary of catch observations from the summer survey is the starting point, but there are a number of *ad hoc* interventions done to generate Table 1
- “select few” solution : SAS to R report, use a list of species that was used previously in a SAS script
- a flexible solution in the gulf package, using functions *taxonomic.group* and *years.recorded*, to obtain a defensible list of species and years when indices of abundance and biomass, and distribution maps can be generated
- this workshop

WoRMS to extract taxonomic details from an AphiaID

```
## REQUESTING 1 ITEMS BY ID from World Register of Marine Species
## ,126436
## by id ..... DONE

## AphiaID
## 1 126436 https://www.marinespecies.org/aphia.php?p=taxdetails&id=126436
## scientificname authority status unacceptreason taxon
## 1 Gadus morhua Linnaeus, 1758 accepted NA
## valid_AphiaID valid_name valid_authority parentNameUsage
## 1 126436 Gadus morhua Linnaeus, 1758 126436
## phylum class order family genus
## 1 Chordata Actinopteri Gadiformes Gadidae Gadus
##
## 1 Froese, R. and D. Pauly. Editors. (2022). FishBase. Gadus morhua
## lsid isMarine isBrachiolepis
## 1 urn:lsid:marinespecies.org:taxname:126436 1
```

1 - all possible combinations of years and species

for all possible species s and year y , define an $s \times y$ matrix that denotes all possible combinations, and set all of them equal to zero

$$S_{all} \tag{1}$$

2 - catch records

using the database catch records, generate another s and year y matrix showing what species codes are used in the database catch records

$$S_{observed} \quad (2)$$

- this matrix should have smaller dimensions than S_{all}
- values of zero denote that no observations of a given species was made in a given year

3 - time period with consistency of observations

- for each species code that we see in the database catch table, note the years when it was/is expected to be recorded
- examples for shrimps, sponges and small cod

$$S_{recorded} \quad (3)$$

4 - aggregation by groups of species

define an s by s matrix that encodes the species groupings

- add a third dimension, the taxonomic rank
- lower the rank of observations and add the catches for the group
- this is what is done in our “SAS to R” report
- example with *Liparis* species
- example with wolffish species

summary of Gulf Region 2022 post-survey fixes required

- before the survey, creation of new 5-digit codes for cases where no merge could be achieved between Quebec and Gulf
- few fixes required for fish species, but it was mainly for invertebrates
 - non-taxonomic
 - taxonomic precision
 - discrepancy between ID guide and Andes

identification guides

- what we mean we say “the invertebrate identification guide”: [Nozères, C. 2015. St. Lawrence marine invertebrates posters. figshare.](#)

Nozères, C. et Archambault, D. 2014. Portfolio pour l'identification rapide d'invertébrés capturés au chalut dans l'estuaire et le nord du golfe du Saint-Laurent. Rapp. manus. can. sci. halieut. aquat. 3033 : iv + 30 p.

- what we mean we say “the sponge identification guide”

What can we learn from Heracles' experience?

- Heracles was helped by his nephew Iolaus
- if killing the Hydra is the goal, burn its neck using a sword and fire (this seemingly stops the regrowth of heads)
- since killing the Hydra is not the goal here, let's articulate an alternative course of action



For discussion

- what is the citable source for the list used in the Gulf and Maritimes RV surveys?
- worst case scenario: each user had its own copy of a distant list and tweaks it to suit its own needs
- best case scenario:

Discussion

