



eDNA

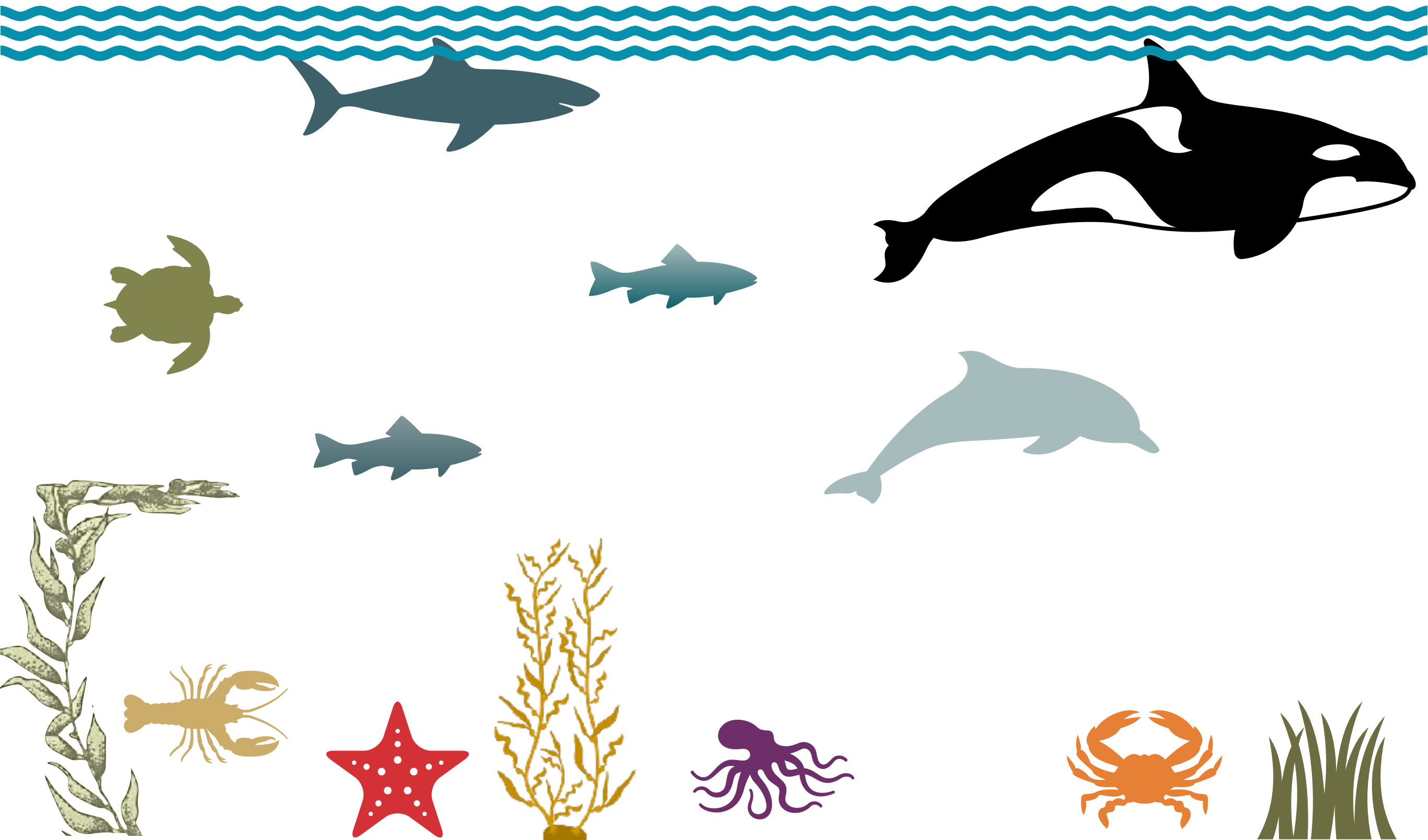
Getting Functional Data for Fish Species Lists

Zack Gold²

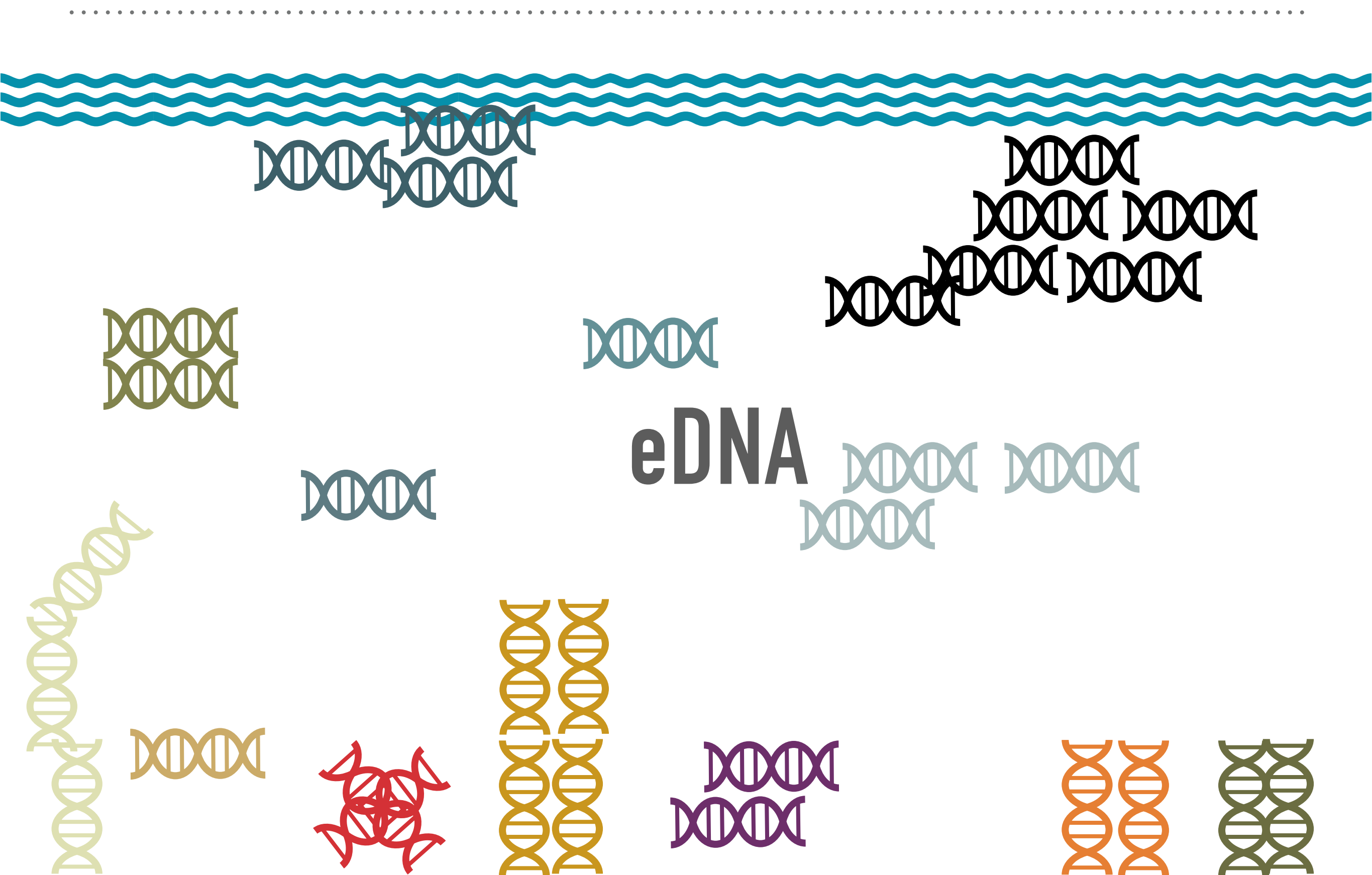
Ph.D. Candidate, Barber Lab, EEB Department, UCLA (Zack.gold@ucla.edu)



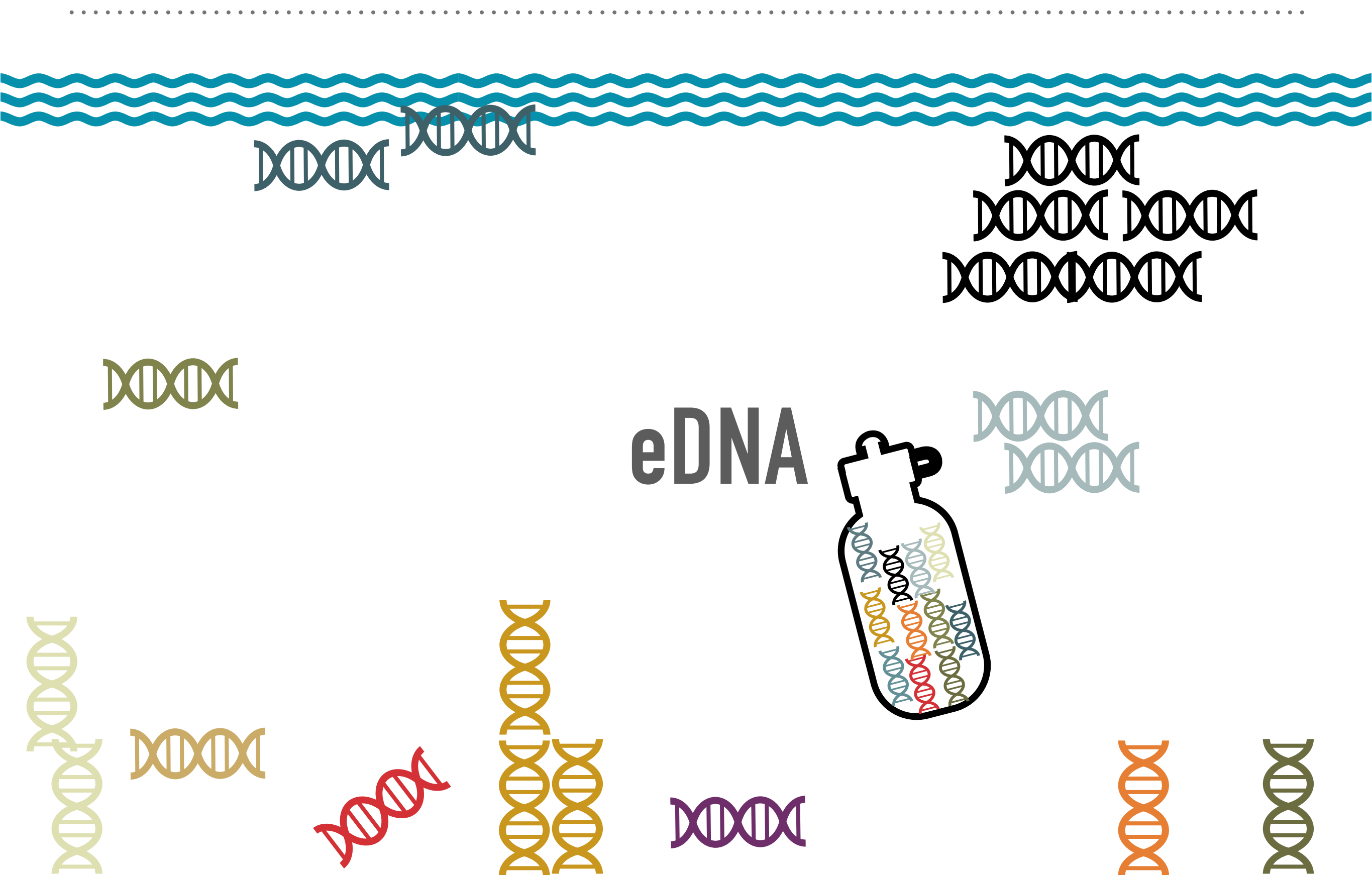
eDNA AS NOVEL BIODIVERSITY ASSESSMENT TOOL

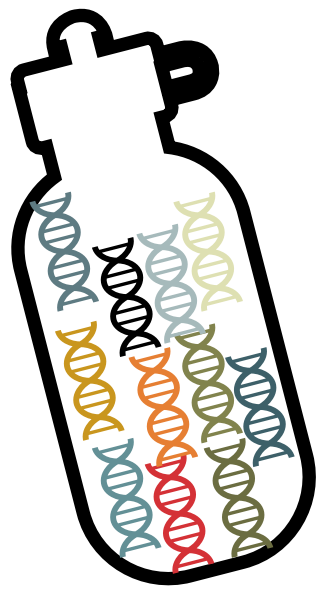


eDNA AS NOVEL BIODIVERSITY ASSESSMENT TOOL

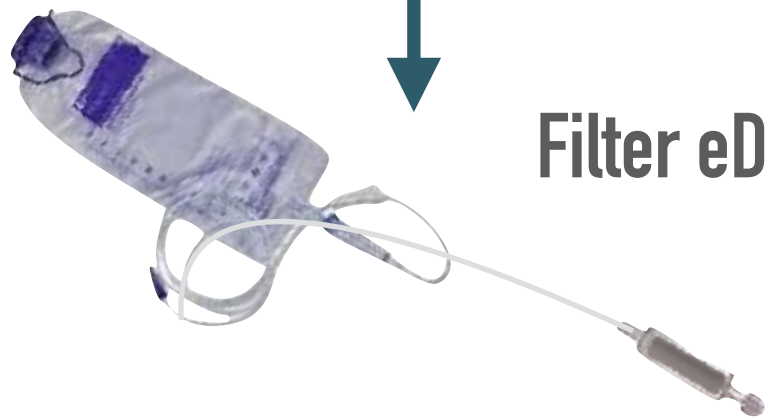


eDNA AS NOVEL BIODIVERSITY ASSESSMENT TOOL





Collect
Sample



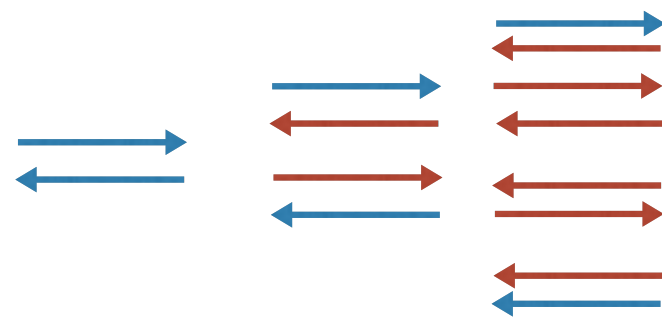
Filter eDNA

eDNA

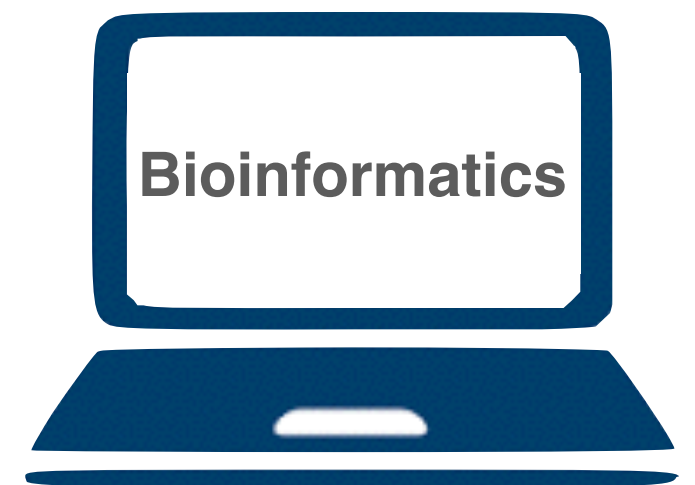
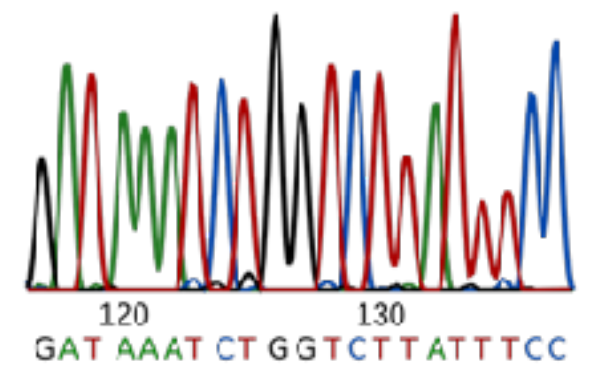


Extract DNA

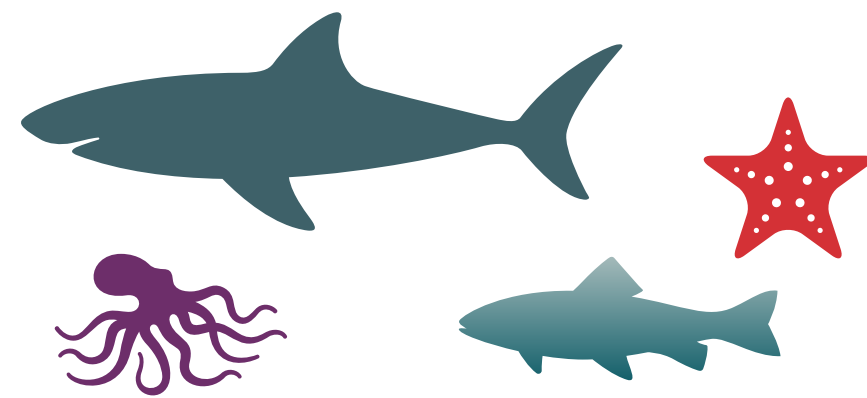
Amplify Target Sequence



Sequence



Species ID &
Relative Abundance





eDNA



FUNCTIONAL TRAITS

- Morphological, biochemical, physiological, structural, phenological, or behavioral characteristics that are expressed in phenotypes of individual organisms
- ex) Length: 100cm
- ex) Depth range 5-10m
- ex) Habitat: Kelp forest

EDNA DATA TABLE

- ;Chordata;Actinopteri;NA;Pomacentridae;Hypsypops;Hypsypops rubicundus
- ;Chordata;Chondrichthyes;Carcharhiniformes;Triakidae;Triakis;Triakis semifasciata
- ;Chordata;Actinopteri;Perciformes;Cottidae;Scorpaenichthys;Scorpaenichthys marmoratus

FISH BASE

[About this page](#)[Languages](#)[User feedbacks](#)[Citation](#)[Uploads](#)[Related species](#)

You are

Hypsypops rubicundus (Girard, 1854) Garibaldi damselfish

[Upload your photos and videos](#)[Pictures](#) | [Google image](#)*Hypsypops rubicundus*

Picture by Cresshall, D.W.

[Add your observation in Fish Watcher](#)[Native range](#) | [All suitable habitat](#) | [Point map](#) | [Year 2100](#)This map was computer generated and the native range is based on
Hypsypops rubicundus - *Agassiz* (ca. 1854) - *Palmer* (ca. 1875) - *GRF* (1988)

Classification / Names

[Damselfish names](#) | [Synonyms](#) | [Catalog of Fishes \(open, esp.\)](#) | [ITIS](#) | [CoE](#) | [WoRMS](#) | [GloFish](#)

Actinopterygii (ray-finned fishes) > Perciformes (Percy-like) > Pomacentridae (Damselfishes) > Pomacentrininae

Etymology: *Hypsypops*: Greek, hypsy, hypops = high + Greek, ops = appearance (Ref. 45335).

Environment: milieu / climate zone / depth range / distribution range

[Ecology](#)

Marine; reef-associated; non-migratory; depth range 0 - 30 m (Ref. 9334). Subtropical; 37°N - 27°N, 122°W - 114°W

Distribution

[Countries](#) | [FAO areas](#) | [Ecosystems](#) | [Occurrences](#) | [Point map](#) | [Introductions](#) | [Faunafl](#)

Eastern Central Pacific: Monterey Bay in California, USA to southern Baja California and Guadalupe Island (off northern central Baja California) in Mexico.

Size / Weight / Age

Maturity: L_m ? range ? - ? cm

Max. length : 30.0 cm SL, male/unknown; (Ref. 7247); max. reported age: 20 years (Ref. 52465)

Short description

[Morphology](#) | [Morphometrics](#)

Dorsal spines (total): 12; Dorsal soft rays (total): 16-17; Anal spines: 2; Anal soft rays: 13 - 14

Biology

[Glossary](#) [Report error](#)

Adults occur over rocky bottom in clear water, often near crevices and small caves, occasionally in kelp. Adults defend a home territory. Feed mainly on attached invertebrates. Oviparous, distinct pairing during breeding (Ref. 205). Eggs are demersal and adhere to the substrate (Ref. 205). Males guard and aerate the eggs (Ref. 205). Have been reared in captivity (Ref. 35420).

Life cycle and mating behavior

[Maturity](#) | [Reproduction](#) | [Spawning](#) | [Eggs](#) | [Fecundity](#) | [Larvae](#)

IMG-1470.JPG

IMG-4937.jpeg

IMG-1446.jpeg

IMG-20190422....jpg

IMG-7527.jpeg

IMG-5491.JPG

IMG-5456.JPG

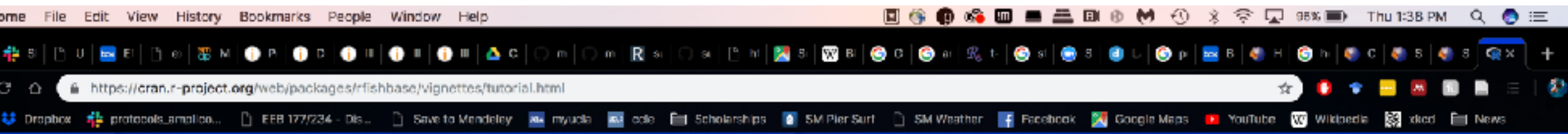
IMG-5479...

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Group 6

Species	Habitat	Food	Max Length (cm)
<i>Hypsypops rubicundus</i>	Reef	Attached invertebrates	30
<i>Chromis punctipinnis</i>	Reef	Planktivorous	25
<i>Scorpaenichthys marmoratus</i>	Reef	Piscivorous	99
<i>Sphyraena argentea</i>	Pelagic	Piscivorous	145



The New rfishbase

Carl Boettiger

2019-03-12

Welcome to `rfishbase` 3.0. This package is the third rewrite of the original `rfishbase` package described in [Boettiger et al. \(2012\)](#).

`rfishbase` 3.0 queries pre-compressed tables from a static server and employs local caching (through memoization) to provide much greater performance and stability, particularly for dealing with large queries involving 10s of thousands of species. The user is never expected to deal with pagination or curl headers and timeouts.

We welcome any feedback, issues or questions that users may encounter through our issues tracker on GitHub: <https://github.com/ropensci/rfishbase/issues>.

Installation

```
remotes::install_github("ropensci/rfishbase")
```

```
library("rfishbase")
```

Getting started

`FishBase` makes it relatively easy to look up a lot of information on most known species of fish. However, looking up a single bit of data, such as the estimated trophic level, for many different species becomes tedious very soon. This is a common reason for using `rfishbase`. As such, our first step is to assemble a good list of species we are interested in.

Building a species list

Almost all functions in `rfishbase` take a list (character vector) of species scientific names, for example:

```
fish <- c("Oreochromis niloticus", "Salmo trutta")
```

You can also read in a list of names from any existing data you are working with. When providing your own species list, you should always begin by validating the names. `validate_names` is provided for this, and this will help



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https://cran.r-project.org/web/packages/traits/traits.pdf

1 / 23

Package 'traits'

September 22, 2017

Title Species Trait Data from Around the Web

Description Species trait data from many different sources, including sequence data from NCBI, plant trait data from 'BET Yeb', plant data from the USDA plants database, data from 'EOL' 'Traitbank', Coral traits data (<<https://coraltraits.org/>>), 'Birdlife' International, and more.

Version 0.3.0

License MIT + file LICENSE

URL <https://github.com/ropensci/traits>

BugReports <https://github.com/ropensci/traits/issues>

LazyData true

VignetteBuilder knitr

Depends R (>= 2.10)

Imports jsonlite (>= 0.9.19), httr (>= 1.1.0), coral (>= 0.3.8), tibble (>= 1.3.4), data.table (>= 1.9.6), readr (>= 1.1.1), xml2 (>= 0.7.4), xml2 (>= 0.1.2), rvest (>= 0.3.1), boardr

Suggests roxygen2 (>= 6.0.1), knitr, testthat, dplyr, plyr

RoxygenNote 6.0.1

NeedsCompilation no

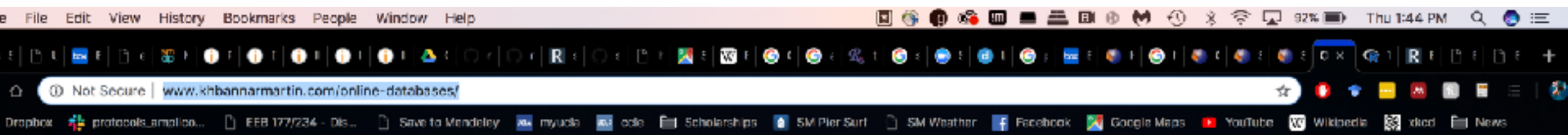
Author Scott Chamberlain [aut, cre],
Zachary Foster [aut],
Ignasi Bartomeus [aut],
David LeBauer [aut],
David Harris [aut]

Maintainer Scott Chamberlain <stymecocystus@gmail.com>

Repository CRAN

08.JPG IMG-8108.jpeg IMG-1470.JPG IMG-4937.jpeg IMG-1446.jpeg IMG-20190422...jpg IMG-7527.jpeg Show All

- **BIEN_trait_traitbyspecies: Download trait data for given species and trait.**
- TR8: an R package for easily retrieving plant species traits
- <http://www.khbannarmartin.com/online-databases/>



Other Data Repositories:

Dryad

DataONE Data Observation Network for Earth

The Long Term Ecological Research Network (LTER)

NatureServe

Tree of Life One Zoom

TreeBASE – a Database of Phylogenetic Knowledge

Map of Life Convergent Evolution

GenBank

All Taxa Biodiversity Inventory (ATBI)

FishBase

IUCN Red List Spatial Data

Global Biodiversity Information Facility (GBIF)

U.S. Government's Open Data

Climate Data:

IRI/LDEO Climate Data Library

