

rinat

Quickstart guide

About

R wrapper for iNaturalist APIs for accessing the observations. The Detailed documentation of API is available on [iNaturalist website](#) and is part of our larger species occurrence searching packages [SPOCC](#)

Install

Install the development version using `install_github` within Hadley's [devtools](#) package.

```
install.packages("devtools")
require(devtools)

install_github("rinat", "ropensci")
library(rinat)
```

Get observations

Searching

Fuzzy search

You can search for observations by either common or latin name. It will search the entire iNaturalist entry, so the search below will return all entries that mention Monarch butterflies, not just entries for Monarchs.

```
butterflies <- get_inat_obs(query = "Monarch Butterfly")
```

Another use for a fuzzy search is searching for a common name or habitat, e.g. searching for all observations that might happen in a vernal pool. We can then see all the species names found.

```
library(rinat)

vp_obs <- get_inat_obs(query = "vernal pool")
head(vp_obs$Species.guess)
```

```
## [1] Rails, Gallinules, and Coots
## [3] Western Spadefoot Western Spadefoot
## [5] Eupsilia upland chorus frog
## 156 Levels: Alisma lanceolatum Alisma plantago-aquatica ... Yellow Starthistle (Centaurea solstitialis)
```

Taxon query To return only records for a specific species or taxonomic group, use the `taxon` option.

```
## Return just observations in the family Plecoptera
stone_flies <- get_inat_obs(taxon = "Plecoptera")

## Return just Monarch Butterfly records
just_butterflies <- get_inat_obs(taxon = "Danaus plexippus")
```

Bounding box search

You can also search within a bounding box by giving a simple set of coordinates.

```
## Search by area

bounds <- c(38.44047, -125, 40.86652, -121.837)
deer <- get_inat_obs(query = "Mule Deer", bounds = bounds)
```

Other functions

Get information and observations by project

You can get all the observations for a project if you know it's ID or name as an intaturalist slug

```
## Just get info about a project
vt_crows <- get_inat_obs_project("crows-in-vermont", type = "info", raw = FALSE)
```

```
## 25 Records
## 0
```

```
## Now get all the observations for that project
vt_crows_obs <- get_inat_obs_project(vt_crows$id, type = "observations")
```

```
## 25 Records
## 0-100
```

Get observation details

Detailed information about a specific observation can be retrieved by observation ID. The easiest way to get the ID is from a more general search.

```
m_obs <- get_inat_obs(query = "Monarch Butterfly")
head(get_inat_obs_id(m_obs$id[1]))
```

```
## $captive
## [1] FALSE
##
## $comments_count
## [1] 0
##
## $community_taxon_id
## NULL
##
## $created_at
## [1] "2014-03-20T13:40:34-03:00"
##
## $delta
## [1] TRUE
##
## $description
## [1] "Two individuals flying around in the grassy margin of a large eucalyptus grove, adjacent to a s
```

Get all observations by user

If you just want all the observations by a user you can download all their observations by user ID. A word of warning though, this can be quite large (easily into the 1000's)

```
m_obs <- get_inat_obs(query = "Monarch Butterfly")
head(get_inat_obs_user(as.character(m_obs$User.login[1]), maxresults = 20))[,
  1:5]
```

```
##           Scientific.name           Datetime
## 1          Danaus plexippus 2014-03-18 15:59:56 +0000
## 2           Taricha torosa 2014-02-26 22:30:00 +0000
## 3 Toxicoscordion fremontii 2014-03-09 14:21:50 +0000
## 4 Coluber lateralis euryxanthus 2014-03-09 14:32:59 +0000
##
## 1
## 2
## 3
## 4 The snake was approximately 50 cm long. It was seen sitting motionless in a bare patch on a east-s
##           Place.guess Latitude
## 1 Point Pinole Regional Shoreline, CA, US    38.00
## 2      Tilden Regional Park, CA, US         37.91
## 3      Briones Regional Park, CA, US         37.91
## 4      Briones Regional Park, CA, US         37.92
```

Stats by taxa

Basic statistics are available for taxa counts by date, date range, place ID (numeric ID), or user ID (string)

```
## By date
counts <- get_inat_taxon_stats(date = "2010-06-14")
counts

## $total
## [1] 49
##
## $species_counts
##   count taxon.id      taxon.name taxon.rank taxon.rank_level
## 1     1    58564    Boloria bellona   species              10
## 2     1    81746  Necrophila americana   species              10
## 3     1    17009    Sayornis saya       species              10
## 4     1   24422 Ptychohyala spinipollex   species              10
## 5     1   11935   Tachycineta bicolor   species              10
##   taxon.default_name.created_at taxon.default_name.creator_id
## 1 2010-04-01T14:12:20-05:00      NA
## 2 2011-10-22T06:37:44-05:00    1392
## 3 2008-03-12T22:33:21-05:00      NA
## 4 2008-03-17T19:43:27-05:00      NA
## 5 2008-03-12T22:10:45-05:00      NA
##   taxon.default_name.id taxon.default_name.is_valid
## 1          92809      TRUE
## 2          211685      TRUE
## 3          20375      TRUE
## 4          29116      TRUE
```

```

## 5          14831          TRUE
##  taxon.default_name.lexicon taxon.default_name.name
## 1          English      meadow fritillary
## 2          English American Carrion Beetle
## 3          English      Say's Phoebe
## 4      Scientific Names Ptychohyla spinipollex
## 5          English      Tree Swallow
##  taxon.default_name.name_provider taxon.default_name.source_id
## 1          UBioNameProvider          2
## 2          <NA>          NA
## 3          ColNameProvider          1
## 4          ColNameProvider          1
## 5          ColNameProvider          1
##  taxon.default_name.source_identifier
## 1          839117
## 2          <NA>
## 3          850333
## 4          3845913
## 5          850447
##                                     taxon.default_name.source_url
## 1                                     http://www.ubio.org/browser/details.php?namebankID=839117
## 2                                     <NA>
## 3 http://www.catalogueoflife.org/annual-checklist/show_species_details.php?record_id=1365378
## 4 http://www.catalogueoflife.org/annual-checklist/show_species_details.php?record_id=1569188
## 5 http://www.catalogueoflife.org/annual-checklist/show_species_details.php?record_id=1618023
##  taxon.default_name.taxon_id taxon.default_name.updated_at
## 1          58564      2010-04-01T14:12:20-05:00
## 2          81746      2011-10-22T06:37:44-05:00
## 3          17009      2008-03-12T22:33:21-05:00
## 4          24422      2008-03-17T19:43:27-05:00
## 5          11935      2008-03-12T22:10:45-05:00
##  taxon.default_name.updater_id
## 1          NA
## 2          1392
## 3          NA
## 4          NA
## 5          NA
##                                     taxon.image_url
## 1 http://farm4.staticflickr.com/3137/4563715160_60ea310ff4_s.jpg
## 2 http://farm5.staticflickr.com/4013/4658689710_1a534b47ef_s.jpg
## 3 http://farm4.staticflickr.com/3382/3333991507_7fa8dfa600_s.jpg
## 4 http://farm5.staticflickr.com/4093/4769499547_523a426857_s.jpg
## 5 http://farm1.staticflickr.com/177/435466650_1ea6cb197e_s.jpg
##  taxon.iconic_taxon_name taxon.conservation_status_name
## 1          Insecta          <NA>
## 2          Insecta          <NA>
## 3          Aves      least_concern
## 4          Amphibia      endangered
## 5          Aves      least_concern
##
## $rank_counts
## $rank_counts$subspecies
## [1] 1
##

```

```
## $rank_counts$genus
## [1] 3
##
## $rank_counts$species
## [1] 44
##
## $rank_counts$variety
## [1] 1
```

```
## By place_ID
vt_crows <- get_inat_obs_project("crows-in-vermont", type = "info", raw = FALSE)
```

```
## 25 Records
## 0
```

```
place_counts <- get_inat_taxon_stats(place = vt_crows$place_id)
place_counts
```

```
## $total
## [1] 3772
##
## $species_counts
##   count taxon.id      taxon.name taxon.rank taxon.rank_level
## 1   349   52391    Pinus strobus   species             10
## 2   320   49005    Quercus rubra   species             10
## 3   274   49202    Fagus grandifolia species             10
## 4   233   48734    Tsuga canadensis species             10
## 5   230    5212    Buteo jamaicensis species             10
##   taxon.default_name.created_at taxon.default_name.creator_id
## 1   2009-07-14T16:17:36-03:00      NA
## 2   2009-01-10T00:20:56-02:00      NA
## 3   2009-01-21T05:04:08-02:00      NA
## 4   2008-11-17T13:31:09-02:00      NA
## 5   2008-03-12T23:47:36-03:00      NA
##   taxon.default_name.id taxon.default_name.is_valid
## 1             83116      TRUE
## 2             78334      TRUE
## 3             78629      TRUE
## 4             77895      TRUE
## 5             6745      TRUE
##   taxon.default_name.lexicon taxon.default_name.name
## 1             English    Eastern White Pine
## 2             English    northern red oak
## 3             English    American Beech
## 4             English    Eastern Hemlock
## 5             English    Red-tailed Hawk
##   taxon.default_name.name_provider taxon.default_name.source_id
## 1             ColNameProvider      1
## 2             UBioNameProvider      2
## 3             UBioNameProvider      2
## 4             UBioNameProvider      2
## 5             ColNameProvider      1
```

```

##   taxon.default_name.source_identifier
## 1                               1903147
## 2                               796025
## 3                               972534
## 4                               838136
## 5                               848620
##
##                                     taxon.default_name.sou
## 1 http://www.catalogueoflife.org/annual-checklist/2009/show_common_name_details.php?name=Eastern+whi
## 2                               http://www.ubio.org/browser/details.php?namebankID=
## 3                               http://www.ubio.org/browser/details.php?namebankID=
## 4                               http://www.ubio.org/browser/details.php?namebankID=
## 5                               http://www.catalogueoflife.org/annual-checklist/show_species_details.php?record_id=
##   taxon.default_name.taxon_id taxon.default_name.updated_at
## 1                               52391      2012-08-27T07:25:39-03:00
## 2                               49005      2013-09-29T08:23:43-03:00
## 3                               49202      2012-08-27T07:05:00-03:00
## 4                               48734      2012-08-28T07:00:54-03:00
## 5                               5212       2008-03-12T23:47:36-03:00
##   taxon.default_name.updater_id
## 1                               7996
## 2                               7996
## 3                               7996
## 4                               7996
## 5                               NA
##
##                                     taxon.image_url
## 1 http://farm4.staticflickr.com/3261/2923651680_b6f373defd_s.jpg
## 2 http://farm4.staticflickr.com/3473/3235731853_5f08927f08_s.jpg
## 3 http://farm4.staticflickr.com/3169/2925868680_201c5c6b06_s.jpg
## 4 http://farm4.staticflickr.com/3076/2861403736_aef342656f_s.jpg
## 5 http://farm4.staticflickr.com/3233/2939911664_a9e7513df5_s.jpg
##   taxon.iconic_taxon_name taxon.conservation_status_name
## 1           Plantae           NA
## 2           Plantae           NA
## 3           Plantae           NA
## 4           Plantae           NA
## 5             Aves           NA
##
## $rank_counts
## $rank_counts$phylum
## [1] 10
##
## $rank_counts$superfamily
## [1] 12
##
## $rank_counts$class
## [1] 17
##
## $rank_counts$infraorder
## [1] 1
##
## $rank_counts$subfamily
## [1] 16
##
## $rank_counts$stateofmatter

```

```
## [1] 1
##
## $rank_counts$family
## [1] 150
##
## $rank_counts$epifamily
## [1] 1
##
## $rank_counts$genus
## [1] 513
##
## $rank_counts$order
## [1] 46
##
## $rank_counts$suborder
## [1] 10
##
## $rank_counts$subspecies
## [1] 62
##
## $rank_counts$subclass
## [1] 2
##
## $rank_counts$variety
## [1] 25
##
## $rank_counts$hybrid
## [1] 14
##
## $rank_counts$kingdom
## [1] 5
##
## $rank_counts$form
## [1] 4
##
## $rank_counts$fo
## [1] 1
##
## $rank_counts$species
## [1] 2873
##
## $rank_counts$tribe
## [1] 9
```

Stats by user

Similar statistics can be gotten for users. The same input parameters can be used, but results are the top five users by species count and observation count.

```
## By date
counts <- get_inat_user_stats(date = "2010-06-14")
counts
```

```
## $total
```

```
## [1] 25
##
## $most_observations
##   count user.id user.login  user.name
## 1    10    9706 greglasley Greg Lasley
## 2     4     357  annetanne
## 3     4    10285   finatic   BJ Stacey
## 4     3     873   tapbirds   Scott Cox
## 5     3    18056   plantman      <NA>
##                                     user.user_icon_url
## 1 http://www.inaturalist.org/attachments/users/icons/9706-thumb.jpg?1389224786
## 2 http://www.inaturalist.org/attachments/users/icons/357-thumb.jpg?1362061338
## 3 http://www.inaturalist.org/attachments/users/icons/10285-thumb.jpg?1350000458
## 4 http://www.inaturalist.org/attachments/users/icons/873-thumb.jpg
## 5                                     <NA>
##
## $most_species
##   count user.id user.login  user.name
## 1    10    9706 greglasley Greg Lasley
## 2     4    10285   finatic   BJ Stacey
## 3     3    3403   davidr    David R
## 4     3     382   tsoleau
## 5     3     873   tapbirds   Scott Cox
##                                     user.user_icon_url
## 1 http://www.inaturalist.org/attachments/users/icons/9706-thumb.jpg?1389224786
## 2 http://www.inaturalist.org/attachments/users/icons/10285-thumb.jpg?1350000458
## 3 http://www.inaturalist.org/attachments/users/icons/3403-thumb.jpg?1394954695
## 4 http://www.inaturalist.org/attachments/users/icons/382-thumb.jpg
## 5 http://www.inaturalist.org/attachments/users/icons/873-thumb.jpg
```

```
## By place_ID
vt_crows <- get_inat_obs_project("crows-in-vermont", type = "info", raw = FALSE)
```

```
## 25 Records
## 0
```

```
place_counts <- get_inat_user_stats(place = vt_crows$place_id)
place_counts
```

```
## $total
## [1] 285
##
## $most_observations
##   count user.id  user.login  user.name
## 1  5571   2179    charlie   Charlie Hohn
## 2  2747  12610 susanelliott Susan Elliott
## 3  2228   317    catharus Kent McFarland
## 4  2050  11792   kylejones   Kyle Jones
## 5  1614  12036   cotaweaver   Zac Cota
##                                     user.user_icon_url
## 1 http://www.inaturalist.org/attachments/users/icons/2179-thumb.jpg?1367974806
## 2 http://www.inaturalist.org/attachments/users/icons/12610-thumb.jpg?1390441055
```



```
## 3 http://www.inaturalist.org/attachments/users/icons/317-thumb.jpg?1373935791
## 4 http://www.inaturalist.org/attachments/users/icons/11792-thumb.jpg?1394793142
## 5 http://www.inaturalist.org/attachments/users/icons/12036-thumb.jpg?1387504441
##
## $most_species
##   count user.id  user.login  user.name
## 1  1215   12610 susanelliott Susan Elliott
## 2  1025   11792   kylejones   Kyle Jones
## 3   835   12045   larry522 Larry Clarfeld
## 4   807    317    catharus Kent McFarland
## 5   719   2179    charlie   Charlie Hohn
##
##                                     user.user_icon_url
## 1 http://www.inaturalist.org/attachments/users/icons/12610-thumb.jpg?1390441055
## 2 http://www.inaturalist.org/attachments/users/icons/11792-thumb.jpg?1394793142
## 3 http://www.inaturalist.org/attachments/users/icons/12045-thumb.jpg?1357252118
## 4 http://www.inaturalist.org/attachments/users/icons/317-thumb.jpg?1373935791
## 5 http://www.inaturalist.org/attachments/users/icons/2179-thumb.jpg?1367974806
```

Mapping.

Basic maps can be created as well to quickly visualize search results. Maps can either be plotted automatically `plot = TRUE` or simply return a `ggplot2` object with `plot = FALSE`. This works well with single species data, but more complicated plots are best made from scratch.

```
library(rinat)
library(ggplot2)

## Map salamanders in the genus Ambystoma
m_obs <- get_inat_obs(taxon = "Ambystoma maculatum")

salamander_map <- inat_map(m_obs, plot = FALSE)
#### Now we can modify the returned map
salamander_map + borders("state") + theme_bw()
```

```
## Warning: Removed 4 rows containing missing values (geom_point).
```