

# Package ‘fqar’

October 13, 2022

**Type** Package

**Title** Floristic Quality Assessment Tools for R

**Version** 0.2.1

**Description** Tools for downloading and analyzing floristic quality assessment data.  
See Freyman et al. (2015) <[doi:10.1111/2041-210X.12491](https://doi.org/10.1111/2041-210X.12491)> for more information  
about floristic quality assessment and the associated database.

**License** MIT + file LICENSE

**Encoding** UTF-8

**Language** en\_US

**LazyData** true

**Imports** dplyr, httr, jsonlite, rlang, tidyr

**RoxygenNote** 7.2.1

**Suggests** ggplot2, knitr, rmarkdown, testthat

**Depends** R (>= 4.1.0)

**VignetteBuilder** knitr

**URL** <https://github.com/equitable-equations/fqar/>

**BugReports** <https://github.com/equitable-equations/fqar/issues>

**NeedsCompilation** no

**Author** Myers Alexia [aut],  
Gard Andrew [aut, cre]

**Maintainer** Gard Andrew <[agard@lakeforest.edu](mailto:agard@lakeforest.edu)>

**Repository** CRAN

**Date/Publication** 2022-08-23 12:40:05 UTC

## R topics documented:

assessment_glance . . . . .	2
assessment_inventory . . . . .	4
assessment_list_glance . . . . .	5

chicago . . . . .	7
download_assessment . . . . .	9
download_assessment_list . . . . .	9
download_transect . . . . .	10
download_transect_list . . . . .	11
index_fqa_assessments . . . . .	12
index_fqa_databases . . . . .	13
index_fqa_transects . . . . .	13
missouri . . . . .	14
transect_glance . . . . .	16
transect_inventory . . . . .	18
transect_list_glance . . . . .	19
transect_phys . . . . .	21

## Index 23

---

assessment_glance	<i>Obtain tidy summary information for a floristic quality assessment</i>
-------------------	---

---

### Description

assessment\_glance() tidies a floristic quality assessment data set obtained from [universalfqa.org](http://universalfqa.org).

### Usage

```
assessment_glance(data_set)
```

### Arguments

data\_set      A data set downloaded from [universalfqa.org](http://universalfqa.org) either manually or using `download_assessment()`

### Value

A data frame with 52 columns:

- Title (character)
- Date (date)
- Site Name (character)
- City (character)
- County (character)
- State (character)
- Country (character)
- FQA DB Region (character)
- FQA DB Publication Year (character)
- FQA DB Description (character)
- Custom FQA DB Name (character)

- Custom FQA DB Description (character)
- Practitioner (character)
- Latitude (character)
- Longitude (character)
- Weather Notes (character)
- Duration Notes (character)
- Community Type Notes (character)
- Other Notes (character)
- Private/Public (character)
- Total Mean C (numeric)
- Native Mean C (numeric)
- Total FQI: (numeric)
- Native FQI (numeric)
- Adjusted FQI (numeric)
- % C value 0 (numeric)
- % C value 1-3 (numeric)
- % C value 4-6 (numeric)
- % C value 7-10 (numeric)
- Native Tree Mean C (numeric)
- Native Shrub Mean C (numeric)
- Native Herbaceous Mean C (numeric)
- Total Species (numeric)
- Native Species (numeric)
- Non-native Species
- Mean Wetness (numeric)
- Native Mean Wetness (numeric)
- Tree (numeric)
- Shrub (numeric)
- Vine (numeric)
- Forb (numeric)
- Grass (numeric)
- Sedge (numeric)
- Rush (numeric)
- Fern (numeric)
- Bryophyte (numeric)
- Annual (numeric)
- Perennial (numeric)
- Biennial (numeric)
- Native Annual (numeric)
- Native Perennial (numeric)
- Native Biennial (numeric)

## Examples

```
# While assessment_glance can be used with a .csv file downloaded manually  
# from the universal FQA website, it is most typically used in combination  
# with download_assessment().
```

```
edison <- download_assessment(25002)  
assessment_glance(edison)
```

---

assessment\_inventory *Obtain species details for a floristic quality assessment*

---

## Description

assessment\_inventory() returns a data frame of all plant species included in a floristic quality assessment obtained from [universalfqa.org](http://universalfqa.org).

## Usage

```
assessment_inventory(data_set)
```

## Arguments

data\_set            A data set downloaded from [universalfqa.org](http://universalfqa.org) either manually or using [download\\_assessment\(\)](#).

## Value

A data frame with 9 columns:

- Scientific Name (character)
- Family (character)
- Acronym (character)
- Native? (character)
- C (numeric)
- W (numeric)
- Physiognomy (character)
- Duration (character)
- Common Name (character)

## Examples

```
# While assessment_glance can be used with a .csv file downloaded  
# manually from the universal FQA website, it is most typically used  
# in combination with download_assessment().
```

```
edison <- download_assessment(25002)  
assessment_inventory(edison)
```

---

`assessment_list_glance`*Obtain tidy summary information for multiple floristic quality assessments*

---

**Description**

`assessment_list_glance()` tidies a list of floristic quality assessment data sets obtained from [universalfqa.org](http://universalfqa.org), returning summary information as a single data frame.

**Usage**

```
assessment_list_glance(assessment_list)
```

**Arguments**`assessment_list`

A list of data sets downloaded from [universalfqa.org](http://universalfqa.org), typically using `download_assessment_list()`.

**Value**

A data frame with 52 columns:

- Title (character)
- Date (date)
- Site Name (character)
- City (character)
- County (character)
- State (character)
- Country (character)
- FQA DB Region (character)
- FQA DB Publication Year (character)
- FQA DB Description (character)
- Custom FQA DB Name (character)
- Custom FQA DB Description (character)
- Practitioner (character)
- Latitude (character)
- Longitude (character)
- Weather Notes (character)
- Duration Notes (character)
- Community Type Notes (character)
- Other Notes (character)

- Private/Public (character)
- Total Mean C (numeric)
- Native Mean C (numeric)
- Total FQI: (numeric)
- Native FQI (numeric)
- Adjusted FQI (numeric)
- % C value 0 (numeric)
- % C value 1-3 (numeric)
- % C value 4-6 (numeric)
- % C value 7-10 (numeric)
- Native Tree Mean C (numeric)
- Native Shrub Mean C (numeric)
- Native Herbaceous Mean C (numeric)
- Total Species (numeric)
- Native Species (numeric)
- Non-native Species
- Mean Wetness (numeric)
- Native Mean Wetness (numeric)
- Tree (numeric)
- Shrub (numeric)
- Vine (numeric)
- Forb (numeric)
- Grass (numeric)
- Sedge (numeric)
- Rush (numeric)
- Fern (numeric)
- Bryophyte (numeric)
- Annual (numeric)
- Perennial (numeric)
- Biennial (numeric)
- Native Annual (numeric)
- Native Perennial (numeric)
- Native Biennial (numeric)

## Examples

```
# While assessment_list_glance can be used with a list of .csv file downloaded
# manually from the universal FQA website, it is most typically used
# in combination with download_assessment_list().

maine <- download_assessment_list(database = 56)
assessment_list_glance(maine)
```

---

chicago

*Chicagoland floristic quality assessment data*

---

## Description

A data set summarizing 786 floristic quality assessments using the 2017 Chicago Region USACE database.

## Usage

```
chicago
```

## Format

A data frame with 52 columns:

- Title (character)
- Date (date)
- Site Name (character)
- City (character)
- County (character)
- State (character)
- Country (character)
- FQA DB Region (character)
- FQA DB Publication Year (character)
- FQA DB Description (character)
- Custom FQA DB Name (character)
- Custom FQA DB Description (character)
- Practitioner (character)
- Latitude (character)
- Longitude (character)
- Weather Notes (character)

- Duration Notes (character)
- Community Type Notes (character)
- Other Notes (character)
- Private/Public (character)
- Total Mean C (numeric)
- Native Mean C (numeric)
- Total FQI: (numeric)
- Native FQI (numeric)
- Adjusted FQI (numeric)
- % C value 0 (numeric)
- % C value 1-3 (numeric)
- % C value 4-6 (numeric)
- % C value 7-10 (numeric)
- Native Tree Mean C (numeric)
- Native Shrub Mean C (numeric)
- Native Herbaceous Mean C (numeric)
- Total Species (numeric)
- Native Species (numeric)
- Non-native Species
- Mean Wetness (numeric)
- Native Mean Wetness (numeric)
- Tree (numeric)
- Shrub (numeric)
- Vine (numeric)
- Forb (numeric)
- Grass (numeric)
- Sedge (numeric)
- Rush (numeric)
- Fern (numeric)
- Bryophyte (numeric)
- Annual (numeric)
- Perennial (numeric)
- Biennial (numeric)
- Native Annual (numeric)
- Native Perennial (numeric)
- Native Biennial (numeric)

**Source**

[universalfqa.org](http://universalfqa.org)



---

download\_assessment     *Download a single floristic quality assessment*

---

### Description

download\_assessment() retrieves a specified floristic quality assessment from [universalfqa.org](http://universalfqa.org). ID numbers for assessments in various databases can be found using the [index\\_fqa\\_assessments\(\)](#) function.

### Usage

```
download_assessment(assessment_id)
```

### Arguments

assessment\_id     A numeric identifier of the desired floristic quality assessment, as specified by [universalfqa.org](http://universalfqa.org). ID numbers for assessments in specified databases can be viewed with the [index\\_fqa\\_assessments\(\)](#) function.

### Value

An untidy data frame in the original format of the Universal FQA website. Use [assessment\\_glance\(\)](#) for a tidy summary and [assessment\\_inventory\(\)](#) for species-level data.

### Examples

```
databases <- index_fqa_databases()
# Note database 1 is the original 1994 Chicago edition.

chicago_assessments <- index_fqa_assessments(1) # Edison dune and swale has id number 25002.
edison <- download_assessment(25002)

edison_tidy <- assessment_glance(edison)
edison_species <- assessment_inventory(edison)
```

---

download\_assessment\_list  
                          *Download multiple floristic quality assessments*

---

### Description

download\_assessment\_list() searches a specified floristic quality assessment database and retrieves all matches from [universalfqa.org](http://universalfqa.org). Download speeds from that website may be slow, causing delays in the evaluation of this function.

**Usage**

```
download_assessment_list(database_id, ...)
```

**Arguments**

`database_id` Numeric identifier of the desired floristic quality assessment database, as specified by [universalfqa.org](http://universalfqa.org). Database id numbers can be viewed with the `index_fqa_databases()` function.

`...` dplyr-style filtering criteria for the desired assessments. The following variables may be used:

- `id` (numeric)
- `assessment` (character)
- `date` (date)
- `location` (character)
- `practitioner` (character)

**Value**

A list of data frames matching the search criteria. Each is an untidy data frame in the original format of the Universal FQA website. Use `assessment_list_glance()` for a tidy summary.

**Examples**

```
databases <- index_fqa_databases # Note database 1 is the original 1994 Chicago edition.
somme_assessments <- download_assessment_list(1, site == "Somme Woods")
somme_summary <- assessment_list_glance(somme_assessments)
```

---

<code>download_transect</code>	<i>Download a single floristic quality transect assessment</i>
--------------------------------	--

---

**Description**

`download_transect()` retrieves a specified floristic quality transect assessment from [universalfqa.org](http://universalfqa.org). ID numbers for transect assessments in various databases can be found using the `index_fqa_transects()` function.

**Usage**

```
download_transect(transect_id)
```

**Arguments**

`transect_id` A numeric identifier of the desired floristic quality transect assessment, as specified by [universalfqa.org](http://universalfqa.org). ID numbers for transect assessments in specified databases can be viewed with the `index_fqa_transects()` function.

**Value**

An untidy data frame in the original format of the Universal FQA website. Use `transect_glance()` for a tidy summary, `transect_phys()` for a physiognometric overview, and `transect_inventory()` for species-level data.

**Examples**

```
databases <- index_fqa_databases() # Note database 1 is the original 1994 Chicago edition.
chicago_transects <- index_fqa_transects(1) # CBG Sand prairie swale fen A has id number 5932.
cbg <- download_transect(5932)
cbg_tidy <- transect_glance(cbg)
cbg_species <- transect_inventory(cbg)
cbg_phys <- transect_phys(cbg)
```

---

download\_transect\_list

*Download multiple floristic quality transect assessments*

---

**Description**

`download_transect_list()` searches a specified floristic quality assessment database and retrieves all matches from [universalfqa.org](http://universalfqa.org). Download speeds from that website may be slow, causing delays in the evaluation of this function.

**Usage**

```
download_transect_list(database_id, ...)
```

**Arguments**

database_id	Numeric identifier of the desired floristic quality assessment database, as specified by <a href="http://universalfqa.org">universalfqa.org</a> . Database id numbers can be viewed with the <code>index_fqa_databases()</code> function.
...	dplyr-style filtering criteria for the desired transect assessments. The following variables may be used: <ul style="list-style-type: none"> <li>• id (numeric)</li> <li>• assessment (character)</li> <li>• date (date)</li> <li>• site (character)</li> <li>• practitioner (character)</li> </ul>

**Value**

A list of data frames matching the search criteria. Each is an untidy data frame in the original format of the Universal FQA website. Use `transect_list_glance()` for a tidy summary.

## Examples

```
databases <- index_fqa_databases()
# Note database 1 is the original 1994 Chicago edition.
dupont <- download_transect_list(1, site == "DuPont Natural Area")
```

---

index\_fqa\_assessments *List all available public floristic quality assessments*

---

## Description

For any given database, `index_fqa_assessments()` produces a data frame of all floristic quality assessments publicly available at [universalfqa.org](http://universalfqa.org).

## Usage

```
index_fqa_assessments(database_id)
```

## Arguments

`database_id` A numeric identifier of the desired database, as specified by [universalfqa.org](http://universalfqa.org). The id numbers can be viewed with the `index_fqa_databases()` function.

## Value

A data frame with 5 columns:

- id (numeric)
- assessment (character)
- date (date)
- site (character)
- practitioner (character)

## Examples

```
databases <- index_fqa_databases()
# Note that the 2017 Chicago database has id_number 149
chicago_2017_assessments <- index_fqa_assessments(149)
```

---

index\_fqa\_databases    *List all available floristic quality assessment databases*

---

**Description**

index\_fqa\_databases() produces a data frame showing all floristic quality assessment databases publicly available at [universalfqa.org](http://universalfqa.org).

**Usage**

```
index_fqa_databases()
```

**Value**

A data frame with 4 columns:

- database\_id (numeric)
- region (character)
- year (numeric)
- description (character)

**Examples**

```
databases <- index_fqa_databases()
```

---

index\_fqa\_transects    *List all available public floristic quality transect assessments*

---

**Description**

For any given database, index\_fqa\_transects() produces a data frame of all floristic quality transect assessments publicly available at [universalfqa.org](http://universalfqa.org).

**Usage**

```
index_fqa_transects(database_id)
```

**Arguments**

database\_id    A numeric identifier of the desired database, as specified by [universalfqa.org](http://universalfqa.org). The id numbers can be viewed with the [index\\_fqa\\_databases\(\)](#) function.

**Value**

A data frame with 5 columns:

- id (numeric)
- assessment (character)
- date (date)
- site (character)
- practitioner (character)

**Examples**

```
databases <- index_fqa_databases()
# Note that the 2017 Chicago database has id_number 149
chicago_2017_transects <- index_fqa_transects(149)
```

---

missouri

*Missouri floristic quality assessment data*

---

**Description**

A data set summarizing 216 floristic quality assessments using the 2015 Missouri database.

**Usage**

```
missouri
```

**Format**

A data frame with 52 columns:

- Title (character)
- Date (date)
- Site Name (character)
- City (character)
- County (character)
- State (character)
- Country (character)
- FQA DB Region (character)
- FQA DB Publication Year (character)
- FQA DB Description (character)
- Custom FQA DB Name (character)

- Custom FQA DB Description (character)
- Practitioner (character)
- Latitude (character)
- Longitude (character)
- Weather Notes (character)
- Duration Notes (character)
- Community Type Notes (character)
- Other Notes (character)
- Private/Public (character)
- Total Mean C (numeric)
- Native Mean C (numeric)
- Total FQI: (numeric)
- Native FQI (numeric)
- Adjusted FQI (numeric)
- % C value 0 (numeric)
- % C value 1-3 (numeric)
- % C value 4-6 (numeric)
- % C value 7-10 (numeric)
- Native Tree Mean C (numeric)
- Native Shrub Mean C (numeric)
- Native Herbaceous Mean C (numeric)
- Total Species (numeric)
- Native Species (numeric)
- Non-native Species
- Mean Wetness (numeric)
- Native Mean Wetness (numeric)
- Tree (numeric)
- Shrub (numeric)
- Vine (numeric)
- Forb (numeric)
- Grass (numeric)
- Sedge (numeric)
- Rush (numeric)
- Fern (numeric)
- Bryophyte (numeric)
- Annual (numeric)
- Perennial (numeric)
- Biennial (numeric)
- Native Annual (numeric)
- Native Perennial (numeric)
- Native Biennial (numeric)

**Source**

[universalfqa.org](http://universalfqa.org)

---

transect_glance	<i>Obtain tidy summary information for a floristic quality transect assessment</i>
-----------------	--

---

**Description**

transect\_glance() tidies a floristic quality transect assessment data set obtained from [universalfqa.org](http://universalfqa.org).

**Usage**

```
transect_glance(data_set)
```

**Arguments**

data\_set      A data set downloaded from [universalfqa.org](http://universalfqa.org) either manually or using [download\\_transect\(\)](#).

**Value**

A data frame with 1 row and 54 columns:

- Title (character)
- Date (date)
- Site Name (character)
- City (character)
- County (character)
- State (character)
- Country (character)
- Omernik Level 3 Ecoregion (character)
- FQA DB Region (character)
- FQA DB Publication Year (character)
- FQA DB Description (character)
- FQA DB Selection Name (character)
- Custom FQA DB Name (character)
- Custom FQA DB Description (character)
- Practitioner (character)
- Latitude (character)
- Longitude (character)
- Community Code (character)



- Community Name (character)
- Community Type Notes (character)
- Weather Notes (character)
- Duration Notes (character)
- Environment Description (character)
- Other Notes (character)
- Transect/Plot Type (character)
- Plot Size (m2) (numeric)
- Quadrat/Subplot Size (m2) (numeric)
- Transect Length (m) (numeric)
- Sampling Design Description (character)
- Cover Method (character)
- Private/Public (character)
- Total Mean C (numeric)
- Cover-weighted Mean C (numeric)
- Native Mean C (numeric)
- Total FQI (numeric)
- Native FQI (numeric)
- Cover-weighted FQI (numeric)
- Cover-weighted Native FQI (numeric)
- Adjusted FQI (numeric)
- % C value 0 (numeric)
- % C value 1-3 (numeric)
- % C value 4-6 (numeric)
- % C value 7-10 (numeric)
- Total Species (numeric)
- Native Species (numeric)
- Non-native Species (numeric)
- Mean Wetness (numeric)
- Native Mean Wetness (numeric)
- Annual (numeric)
- Perennial (numeric)
- Biennial (numeric)
- Native Annual (numeric)
- Native Perennial (numeric)
- Native Biennial (numeric)

## Examples

```
# While transect_glance can be used with a .csv file downloaded manually
# from the universal FQA website, it is most typically used in combination
# with download_transect().

tyler <- download_transect(6352)
transect_glance(tyler)
```

---

transect_inventory	<i>Obtain species details for a floristic quality transect assessment</i>
--------------------	---

---

## Description

transect\_inventory() returns a data frame of all plant species included in a floristic quality transect assessment obtained from [universalfqa.org](http://universalfqa.org).

## Usage

```
transect_inventory(data_set)
```

## Arguments

data\_set      A data set downloaded from [universalfqa.org](http://universalfqa.org) either manually or using [download\\_transect\(\)](#).

## Value

A data frame with 13 columns:

- Species (character)
- Family (character)
- Acronym (character)
- Nativity (character)
- C (numeric)
- W (numeric)
- Physiognomy (character)
- Duration (character)
- Frequency (numeric)
- Coverage (numeric)
- Relative Frequency
- Relative Coverage
- Relative Importance Value (numeric)

## Examples

```
# while transect_glance can be used with a .csv file downloaded  
# manually from the universal FQA website, it is most typically used  
# in combination with download_transect().
```

```
tyler <- download_transect(6352)  
transect_inventory(tyler)
```

---

transect\_list\_glance *Obtain tidy summary information for multiple floristic quality transect assessments*

---

## Description

transect\_list\_glance() tidies a list of floristic quality transect assessment data sets obtained from [universalfqa.org](http://universalfqa.org), returning summary information as a single data frame.

## Usage

```
transect_list_glance(transect_list)
```

## Arguments

transect\_list A list of data sets downloaded from [universalfqa.org](http://universalfqa.org), typically using [download\\_transect\\_list\(\)](#).

## Value

A data frame with 54 columns:

- Title (character)
- Date (date)
- Site Name (character)
- City (character)
- County (character)
- State (character)
- Country (character)
- Omernik Level 3 Ecoregion (character)
- FQA DB Region (character)
- FQA DB Publication Year (character)
- FQA DB Description (character)
- FQA DB Selection Name (character)
- Custom FQA DB Name (character)

- Custom FQA DB Description (character)
- Practitioner (character)
- Latitude (character)
- Longitude (character)
- Community Code (character)
- Community Name (character)
- Community Type Notes (character)
- Weather Notes (character)
- Duration Notes (character)
- Environment Description (character)
- Other Notes (character)
- Transect/Plot Type (character)
- Plot Size (m2) (numeric)
- Quadrat/Subplot Size (m2) (numeric)
- Transect Length (m) (numeric)
- Sampling Design Description (character)
- Cover Method (character)
- Private/Public (character)
- Total Mean C (numeric)
- Cover-weighted Mean C (numeric)
- Native Mean C (numeric)
- Total FQI (numeric)
- Native FQI (numeric)
- Cover-weighted FQI (numeric)
- Cover-weighted Native FQI (numeric)
- Adjusted FQI (numeric)
- % C value 0 (numeric)
- % C value 1-3 (numeric)
- % C value 4-6 (numeric)
- % C value 7-10 (numeric)
- Total Species (numeric)
- Native Species (numeric)
- Non-native Species (numeric)
- Mean Wetness (numeric)
- Native Mean Wetness (numeric)
- Annual (numeric)
- Perennial (numeric)
- Biennial (numeric)
- Native Annual (numeric)
- Native Perennial (numeric)
- Native Biennial (numeric)

## Examples

```
# While transect_list_glance can be used with a list of .csv file downloaded  
# manually from the universal FQA website, it is most typically used in  
# combination with download_transect_list().
```

```
transect_list <- download_transect_list(149, id %in% c(3400, 3427))  
transect_list_glance(transect_list)
```

---

transect_phys	<i>Obtain physiognometric information for a floristic quality transect assessment</i>
---------------	---

---

## Description

transect\_phys() returns a data frame with physiognometric information for a floristic quality transect assessment obtained from [universalfqa.org](http://universalfqa.org).

## Usage

```
transect_phys(data_set)
```

## Arguments

data\_set      A data set downloaded from [universalfqa.org](http://universalfqa.org) either manually or using [download\\_transect\(\)](#).

## Value

A data frame with 6 columns:

- Physiognomy (character)
- Frequency (numeric)
- Coverage (numeric)
- Relative Frequency (%) (numeric)
- Relative Coverage (%) (numeric)
- Relative Importance Value (numeric)

## Examples

```
# While transect_phys can be used with a .csv file downloaded  
# manually from the universal FQA website, it is most typically used  
# in combination with download_transect().
```

```
tyler <- download_transect(6352)
```

transect\_phys(tyler)

# Index

## \* datasets

- chicago, [7](#)
- missouri, [14](#)

- assessment\_glance, [2](#)
- assessment\_glance(), [9](#)
- assessment\_inventory, [4](#)
- assessment\_inventory(), [9](#)
- assessment\_list\_glance, [5](#)
- assessment\_list\_glance(), [10](#)

- chicago, [7](#)

- download\_assessment, [9](#)
- download\_assessment(), [2, 4](#)
- download\_assessment\_list, [9](#)
- download\_assessment\_list(), [5](#)
- download\_transect, [10](#)
- download\_transect(), [16, 18, 21](#)
- download\_transect\_list, [11](#)
- download\_transect\_list(), [19](#)

- index\_fqa\_assessments, [12](#)
- index\_fqa\_assessments(), [9](#)
- index\_fqa\_databases, [13](#)
- index\_fqa\_databases(), [10–13](#)
- index\_fqa\_transects, [13](#)
- index\_fqa\_transects(), [10](#)

- missouri, [14](#)

- transect\_glance, [16](#)
- transect\_glance(), [11](#)
- transect\_inventory, [18](#)
- transect\_inventory(), [11](#)
- transect\_list\_glance, [19](#)
- transect\_list\_glance(), [11](#)
- transect\_phys, [21](#)
- transect\_phys(), [11](#)