

FinCatch Documentation

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Invalid Date

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Home

This is documentation for the FinCatch Data System of the Nebraska Game and Parks Fishery Division. FinCatch stores and provides analysis of standard fisheries population surveys. This set of documentation is an accumulation of both developmental and instructional documentation.

Part I

System Components

The FinCatch data system is comprised of a number of separate components, including:

FinCatch

FinCatch is the central website that provides data management capabilities as well as links to other components. FinCatch is written in the asp.mvc framework of .NET 6.

FinCatch Database

The backend database for FinCatch is built in Microsoft SQL Server.

FinCatchDE

FinCatchAG

FinCatchRA

FinCatchAnalysis R Package

FinCatchAccess R Package

FinCatchWebApi

Part II

Analysis R Package

Overview

The FinCatchAnalysis (FCA) R package centralizes standard analysis functions for the FinCatch system and promotes DRY and reusable analysis code practices. The FCA package is built on top of R6 classes which provides a standard programming interface for users of the R package. Analysis functions are available for each individual analysis available and results from each analysis function returns results encapsulated in an R6 class object. All public functions in the package are prefixed with “fca_”. Package R6 objects are prefixed with “fco_”.

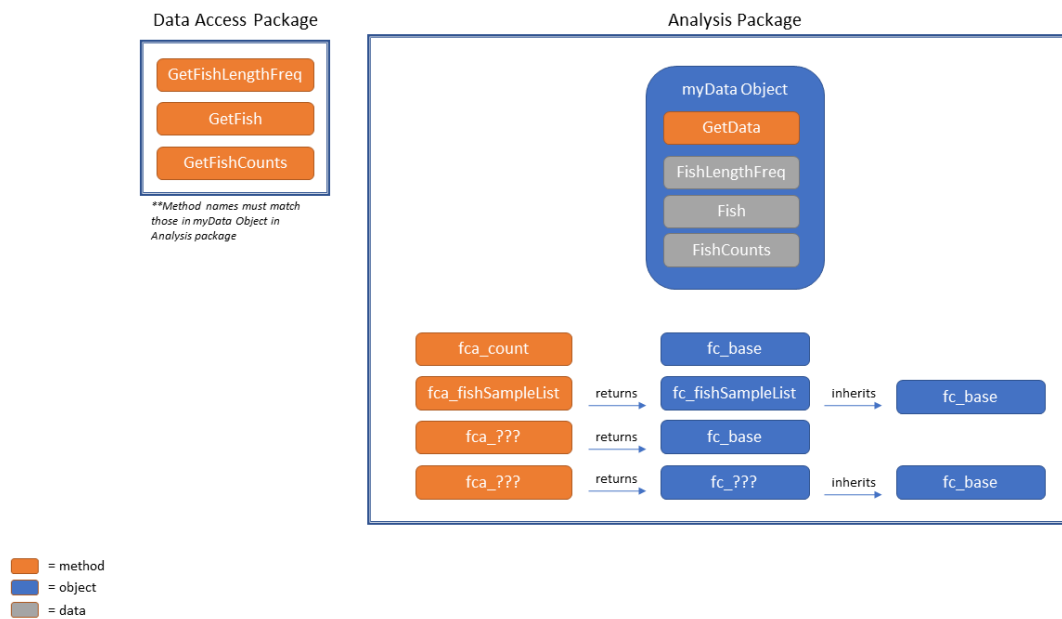
Analysis Functions

Each analysis function in the FCA package provides a single call for an independent analysis and returns a function specific R6 object built on the base fco_ object that provides standard methods and data objects.

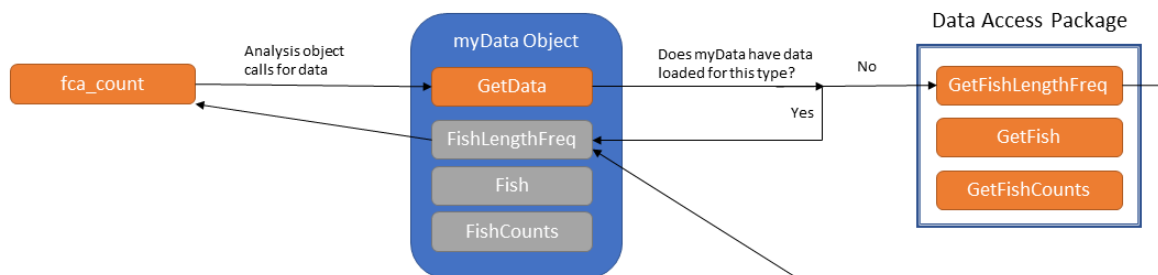
Analysis Return Objects

1 Architecture

1.1 Packages



1.2 WorkFlow



1.3 Principles

By Using myData Object:

- Only data that's needed is loaded
- Data is cached
- Data is only retrieved once for entire analysis string

By Using Separate Data Access Package:

- Isolates and generalizes data access
- Allows analysis code to use different sources of data
- Allows different scripts to use different authentications for data access

2 Example Script

```
library(DataAccessPackage)
library(AnalysisPackage)

#create data access object
dAccess<-myAccess$new

#create data store
dStore<-myData$new(dAccess)

#run counts analysis
countResults<-fca__Counts(dStore)

#display analysis
countResults$results
countResults$printTablesHtml
```

3 Base Object

3.1 Purpose

Provides a common interface for results regardless of what analysis is run.

3.1.1 Variables

- `descriptionText` - (string) Markdown text to be displayed in outputs prior to the output tables and figures
- `tableTitle` - (string) Title text to be used on all object tables
- `groupByVars` - (string) Comma-separated string of variable name to use as grouping variables within the table
- `surveys` - (dataframe) Dataframe containing survey-level data
- `samples` - (dataframe) Dataframe containing samples
- `results` - (list of dataframes) List of dataframes containing results of analysis
- `plots` - (list of ggplot objects) List of ggPlot objects created from analysis
- `errorMessage` - (list of string) Error messages created during analysis
- `groupHeaderBackgroundColor` - (string) Color to be used in background of group header within table, groups are determined by the `groupByVars` variable, used in HTML outputs only
- `groupSummaryBackgroundColor` - (string) Color to be used in the summary row of each group within table, groups are determined by the `groupByVars` variable, used in HTML outputs only
- `gtTheme` - (string) Name of gt tables theme from the `gtExtras` package, used in HTML outputs only

3.1.2 Methods

- print - method used by R to print results to console
- exportJson - method used to create and save Json file of results
- exportCsv - method used to create and save Csv file of results
- createTable - generic table to create both Latex and Html tables for object
- createTableLatex
- createTableHtml
- printTablesLatex
- printTablesHtml
- iterateSurvey

3.2 Overriding Base Object

4 Objects

4.1 `fc_counts` Object

4.2 `fc_fishSampleMedtadata`

5 Methods

5.1 `fca_counts`

- summarizes number of fish caught in samples by species and gender
- returns `fc_counts` object

5.2 `fca_fishSampleMetadata`

- returns metadata for fish samples included in analysis
- returns `fc_fishSampleMetadata` object

6 Create Analysis

Make sure to test for:

- Data selected by surveys only
- Data selected by samples only
- Data selected by both surveys and samples
- Filters that return NO data

Part III

References