

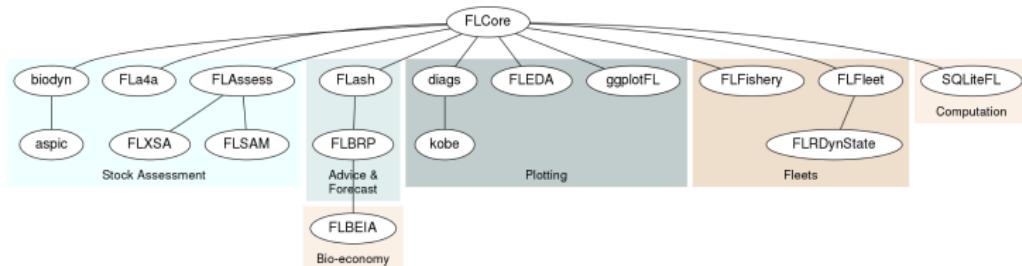
The FLR Project for Quantitative Fisheries Science



FLR Team
Maritime Affairs Unit - IPSC
European Commission
Joint Research Center

FLR, Fisheries Library in R

A collection of packages in the R statistical language providing a domain-specific programming language for quantitative fisheries science.



Goals

1. Provide the tools for effective and reliable implementation of simulation models of the fishery system.
2. Encourage the use of Management Strategy Evaluation for designing robust fisheries management plans.
3. Facilitate the exchange of ideas and algorithms through the establishment of a *lingua franca* for quantitative fisheries science.
4. To do so under the Free/Open Source ethos of transparency, reproducibility and free exchange of ideas and algorithms.



Computational platform



C++
using std::cpp;

CppAD

admb



Philosophy

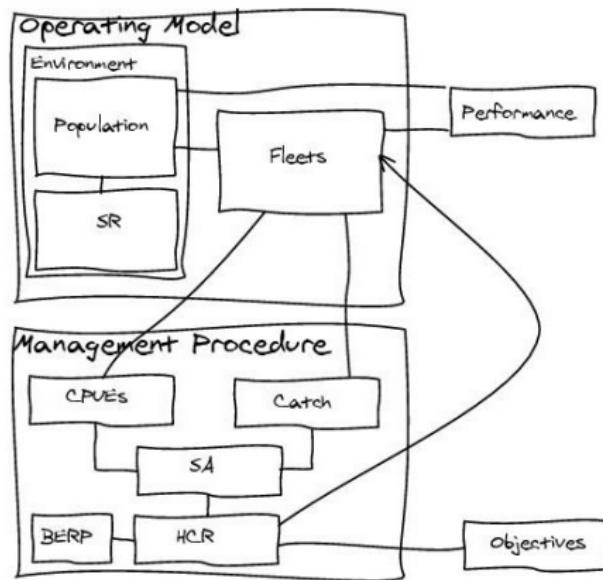


European Union Public Licence (EUPL)



Features: Design

- Designed around the fisheries system elements & processes





Features: the R way

- R powerful and clear syntax

```
rec ~ a * ssb * exp(-b * ssb)
```

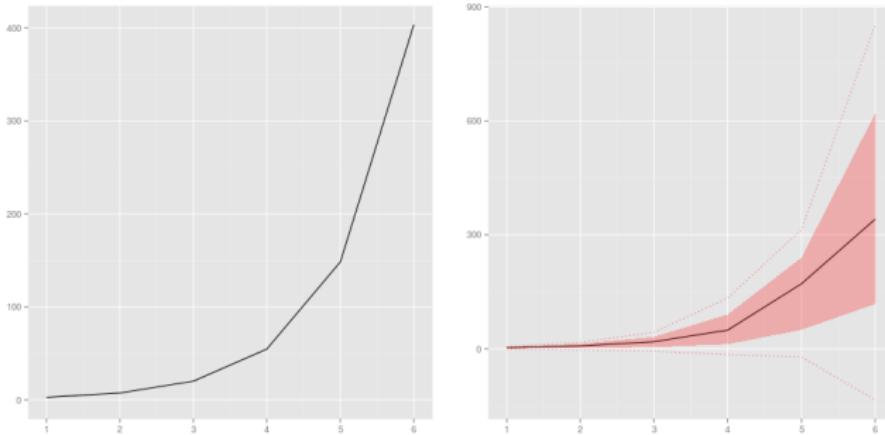
- Reuse R methods

```
summary, plot, [, predict, rnorm, apply, window, ...]
```

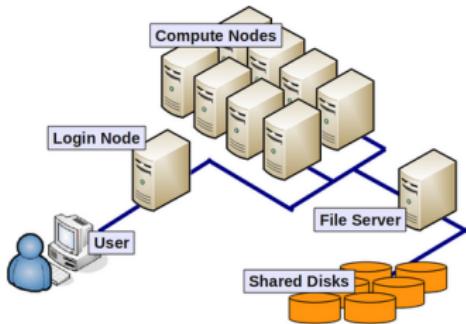
Features: stochasticity

- Objects and methods fully aware of variability

`plot(f1q)`



Features: High Performance Computing





Features: Reproducible Research

```
---
```

```
title: R and markdown
```

```
author: FLR Team, EC JRC G03
```

```
--
```

```
# Results
```

```
This shows the results
```

```
```{.r}
```

```
plot(ple4)
```

```
```
```

```
which looks good.
```

Features: Reproducible Research

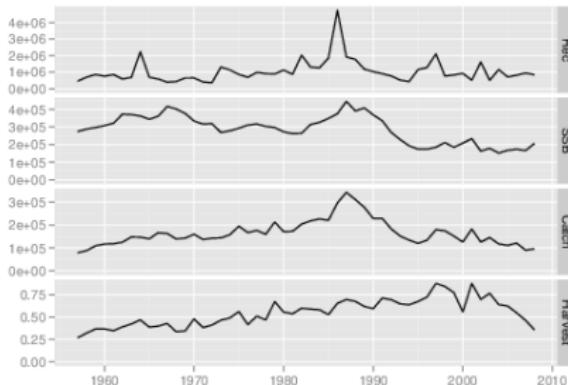
R and markdown

FLR Team, EC JRC G03

Results

This shows the results

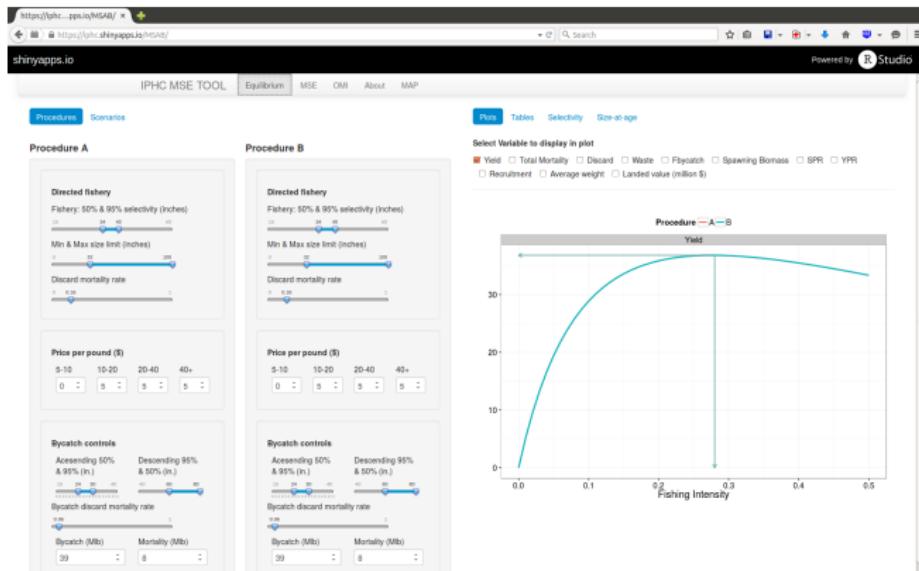
```
plot(p1e4)
```



which look good.

Features: interactive visualization

<https://iphc.shinyapps.io/MSAB/>





A flight over FLR





Stock assessment

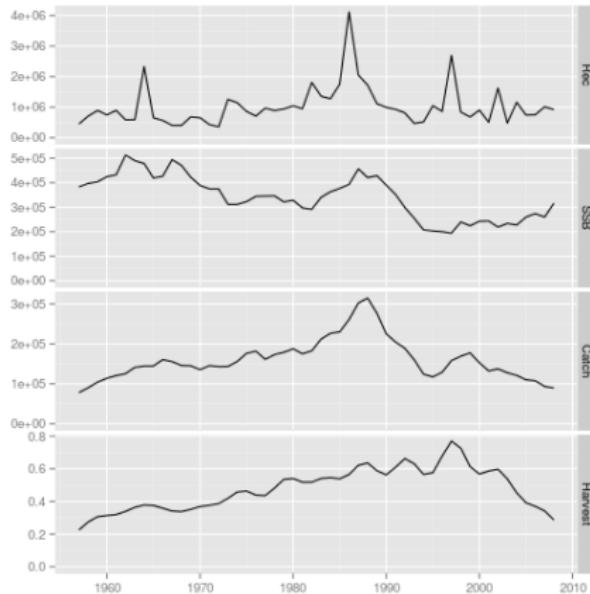
```
# LOAD pkg & data
> library(FLa4a)
> data(ple4)
> data(ple4.index)

# RUN basic a4a SCAA
> fit <- sca(ple4, ple4.index)

# UPDATE stock
> stk <- ple4 + fit
```

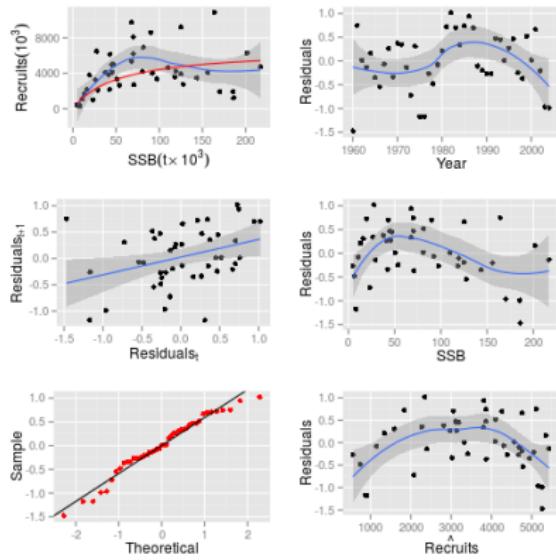
Stock assessment

> `plot(stk)`



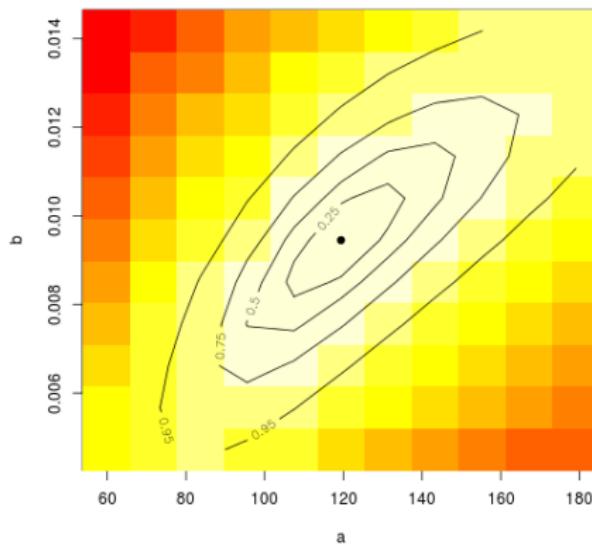
SR

> `plot(nsher)`



SR

> `profile(nsher)`





Advice

```
# Assume future biology
```

```
> fut <- stf(ple4, 3)
```

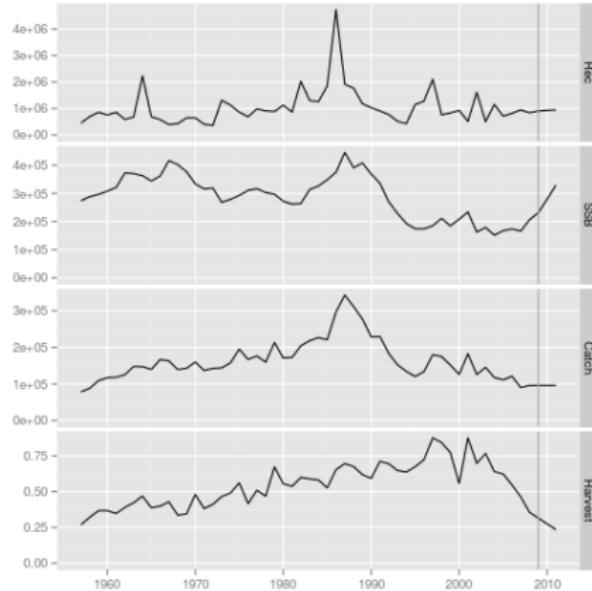
```
# Constant catch
```

```
> fca <- FLQuant(c(catch(ple4)[,'2008']),  
+ dimnames=list(year=2009:2011))
```

```
# Project
```

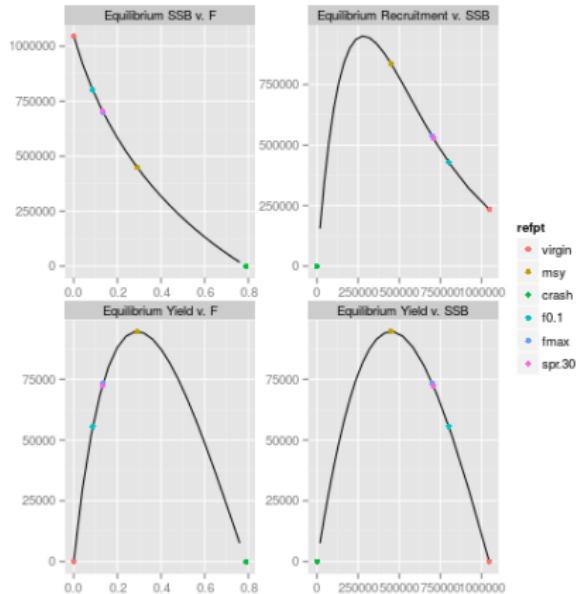
```
> fut <- fwd(fut, sr=psr, catch=fca)
```

Advice



BRP

`plot(prp)`

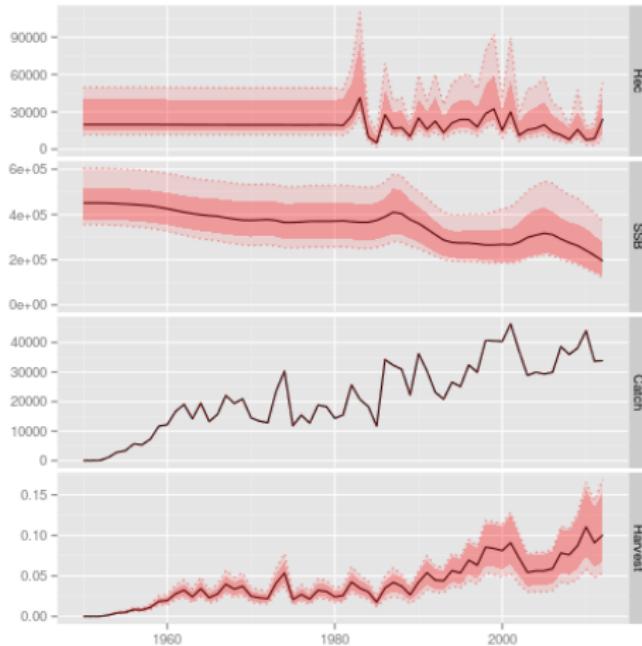




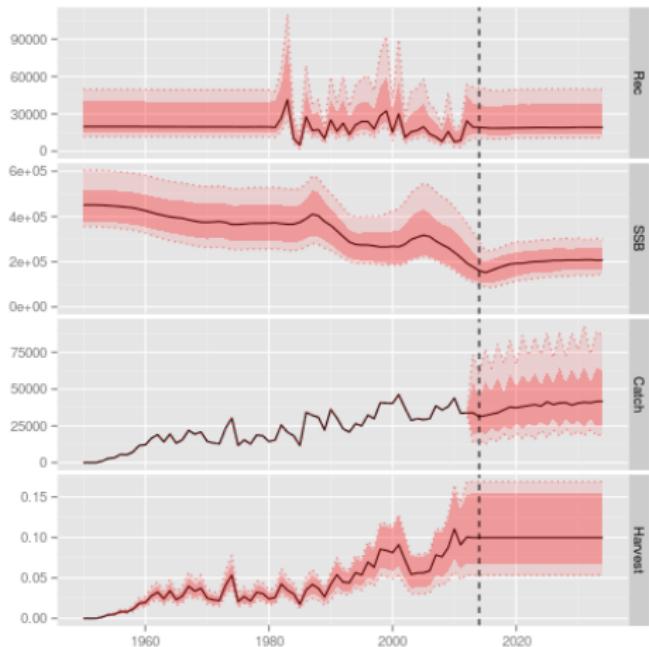
MSE

- IOTC albacore MPs
- Evaluation EU CFP MAPs
- ICCAT MSEs
- MED
- AUS Northern prawn

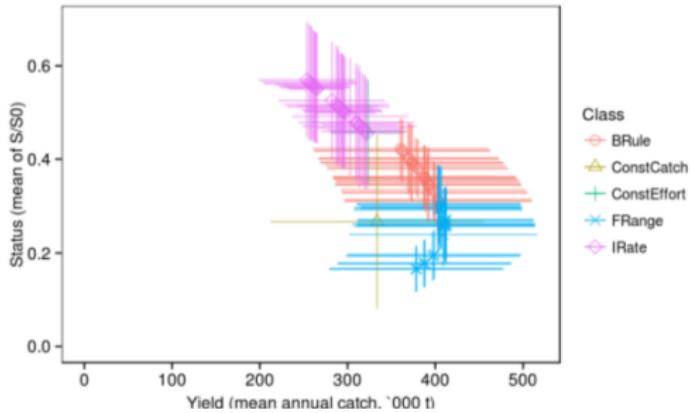
IOTC albacore



IOTC albacore



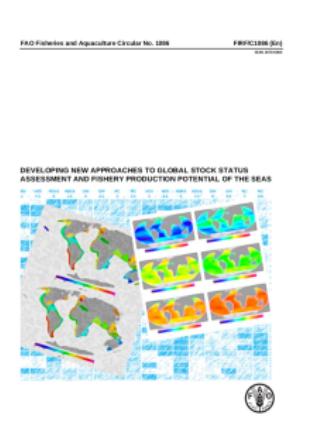
IOTC albacore



Evaluation of catch-only methods

FAO Fisheries and Aquaculture Circular. No. 1086

Rosenberg et al. 2014. *Developing new approaches to global stock status assessment and fishery production potential of the seas*



Teaching

- Course *FLR and a4a for Quantitative Fisheries Science*
- Four days
- Jan 2013, Apr, Aug 2014, Aug 2015
- 65 participants, 14 countries





FLR & a4a for Quantitative Fisheries Science

- INTRODUCTION to R and FLR
- Non-linear model FITTING
- Biomass dynamics STOCK ASSESSMENT
- Statistical Catch-at-age MODELS
- Short and medium term FORECAST
- MANAGEMENT STRATEGY EVALUATION
- REPRODUCIBLE research
- High Performance COMPUTING



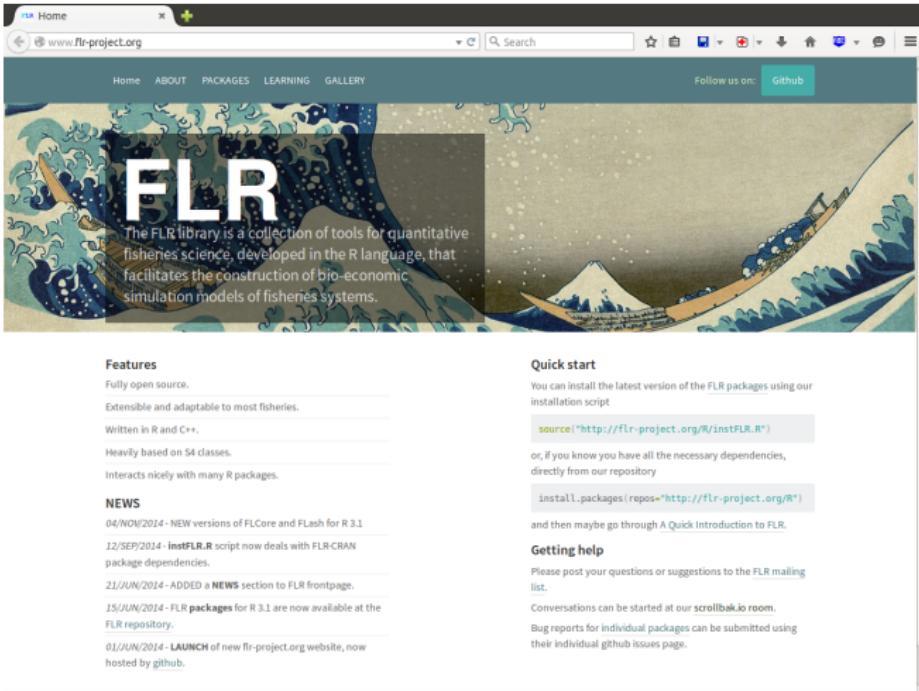
Usage

- 34 articles use or extend it
- 202 articles cite Kell *et al.* 2007.
- 8 RFMOs, 26 WGs
- ICES WGs
- STECF EWGs

Development



To know more



The screenshot shows the homepage of the FLR project website. The header features the European Commission logo and a search bar. Below the header is a navigation menu with links to Home, ABOUT, PACKAGES, LEARNING, and GALLERY. A "Follow us on:" button leads to a GitHub page. The main content area has a background image of a traditional Japanese woodblock print of a wave and a boat. On the left, there's a large "FLR" logo and a brief description of the library. The right side contains sections for "Features", "Quick start", and "Getting help".

FLR

The FLR library is a collection of tools for quantitative fisheries science, developed in the R language, that facilitates the construction of bio-economic simulation models of fisheries systems.

Features

- Fully open source.
- Extensible and adaptable to most fisheries.
- Written in R and C++.
- Heavily based on 54 classes.
- Interacts nicely with many R packages.

NEWS

04/NOV/2014 - NEW versions of FLCore and FLash for R 3.1

12/SEP/2014 - `InstFLR.R` script now deals with FLR-CRAN package dependencies.

21/JUN/2014 - ADDED a [NEWS](#) section to FLR frontpage.

15/JUN/2014 - [FLR packages](#) for R 3.1 are now available at the [FLR repository](#).

01/JUN/2014 - LAUNCH of new [flr-project.org](#) website, now hosted by [github](#).

Quick start

You can install the latest version of the FLR packages using our installation script

```
source('http://flr-project.org/R/instFLR.R')
```

or, if you know you have all the necessary dependencies, directly from our repository

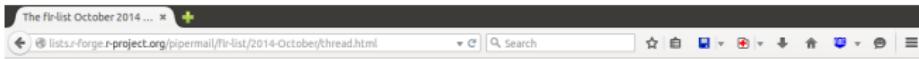
```
install.packages(repos='http://flr-project.org/R')
```

and then maybe go through [A Quick Introduction to FLR](#).

Getting help

Please post your questions or suggestions to the [FLR mailing list](#).
Conversations can be started at our [scrollbaik.io room](#).
Bug reports for individual packages can be submitted using their individual [github issues page](#).

Getting help



October 2014 Archives by thread

- [Messages sorted by: \[subject \] \[author \] \[date \]](#)
- [More info on this list...](#)

Starting: *Thu Oct 2 11:59:31 CEST 2014*

Ending: *Wed Oct 29 17:08:54 CET 2014*

Messages: 21

- [\[fflr-list\] help with XSA Silvia Angelini](#)
 - [\[fflr-list\] help with XSA Iago Mosqueira](#)
 - [\[fflr-list\] help with XSA Silvia Angelini](#)
 - [\[fflr-list\] help with XSA laurie](#)
 - [\[fflr-list\] help with XSA Iago Mosqueira](#)
 - [\[fflr-list\] help with XSA Silvia Angelini](#)
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 - [\[fflr-list\] ssh constraint with Flash Clara Ulrich](#)
 - [\[fflr-list\] ssh constraint with Flash Iago MOSQUEIRA \(JRC\)](#)
 - [\[fflr-list\] ssh constraint with Flash laurie](#)
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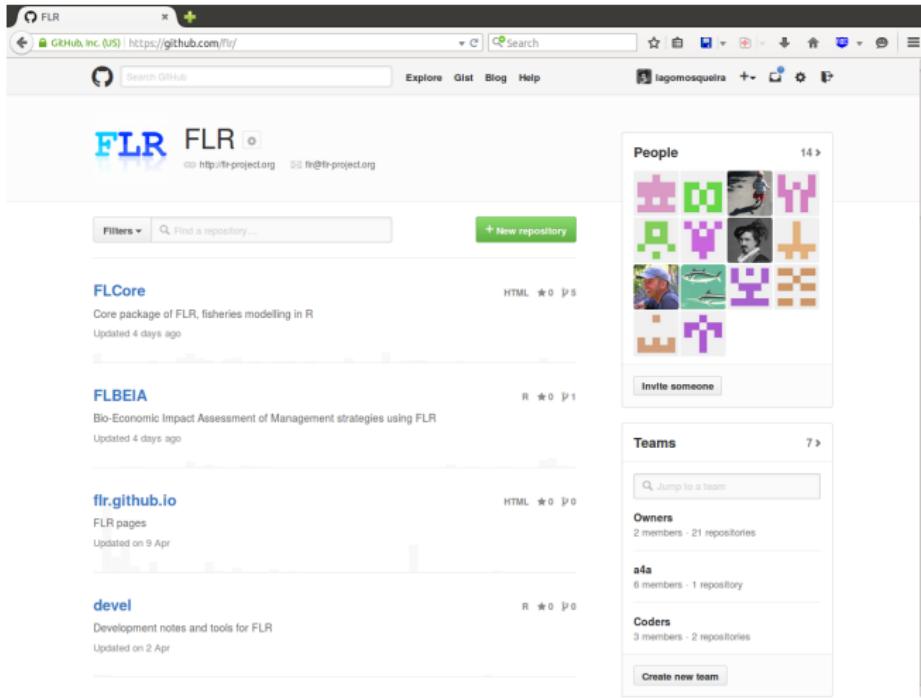
Last message date: *Wed Oct 29 17:08:54 CET 2014*

Archived on: *Wed Oct 29 17:09:11 CET 2014*

- [Messages sorted by: \[subject \] \[author \] \[date \]](#)
- [More info on this list...](#)

This archive was generated by *Pipermail 0.09 (Mailman edition)*.

Source code



The screenshot shows the GitHub profile of the FLR project. The main area displays four repositories: **FLCore**, **FLBEIA**, **flr.github.io**, and **devel**. The **FLCore** repository is the most prominent, showing it's an R package for fisheries modelling. To the right of the repositories, there's a sidebar for the user **lagomosqueira** featuring sections for **People** (a grid of user icons), **Teams** (with a search bar and a list of teams: Owners, a4a, Coders), and a button to **Create new team**.

FLR FLR

http://flr-project.org flr@flr-project.org

Filters Find a repository... + New repository

FLCore Core package of FLR, fisheries modelling in R Updated 4 days ago

HTML ★ 0 35

FLBEIA Bio-Economic Impact Assessment of Management strategies using FLR Updated 4 days ago

R ★ 0 1

flr.github.io FLR pages Updated on 9 Apr

HTML ★ 0 0

devel Development notes and tools for FLR Updated on 2 Apr

R ★ 0 0

People 14 >

Invite someone

Teams 7 >

Jump to a team

Owners 2 members - 21 repositories

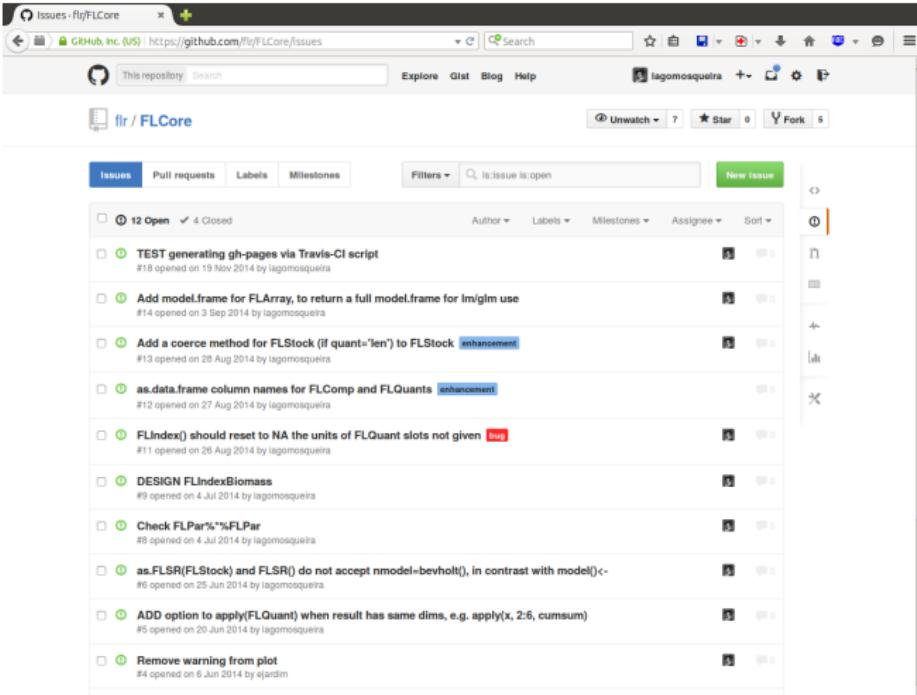
a4a 6 members - 1 repository

Coders 3 members - 2 repositories

Create new team



Bugs, ideas, complaints



A screenshot of a GitHub repository page for the project "flr / FLCore". The page shows a list of open issues. The interface includes a header with the repository name, a search bar, and navigation links for Explore, Gist, Blog, and Help. On the right, there are buttons for Unwatch, Star, Fork, and a gear icon. The main area displays a table of issues with columns for status (Open/Closed), title, author, labels, milestones, assignee, and sort order. Each issue row contains a link to the detailed view and edit buttons.

| Author | Labels | Milestones | Assignee | Sort |
|---|----------|------------|----------|------|
| lagomosqueira | | | | |
| 12 Open | 4 Closed | | | |
| TEST generating gh-pages via Travis-CI script #18 opened on 19 Nov 2014 by lagomosqueira | | | | |
| Add model.frame for FLArray, to return a full model.frame for lm/glm use #14 opened on 3 Sep 2014 by lagomosqueira | | | | |
| Add a coerce method for FLStock (if quant='len') to FLStock <small>enhancement</small> #13 opened on 28 Aug 2014 by lagomosqueira | | | | |
| as.data.frame column names for FLComp and FLQuants <small>enhancement</small> #12 opened on 27 Aug 2014 by lagomosqueira | | | | |
| FLIndex() should reset to NA the units of FLQuant slots not given <small>bug</small> #11 opened on 26 Aug 2014 by lagomosqueira | | | | |
| DESIGN FLIndexBiomass #9 opened on 4 Jul 2014 by lagomosqueira | | | | |
| Check FLPar%>%FLPar #8 opened on 4 Jul 2014 by lagomosqueira | | | | |
| as.FLSR(FLStock) and FLSR() do not accept nmodel=bevhort(), in contrast with model()<- #6 opened on 25 Jun 2014 by lagomosqueira | | | | |
| ADD option to apply(FLQuant) when result has same dims, e.g. apply(x, 2:6, cumsum) #5 opened on 20 Jun 2014 by lagomosqueira | | | | |
| Remove warning from plot #4 opened on 6 Jun 2014 by ejardim | | | | |



FLR

<http://flr-project.org/>

flr-team@flr-project.org



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