

# ICES Web Services and R

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ICES, 27 October 2016



Science for sustainable seas

# Outline



## ICES web services

- Data
- Formats

## R

- Read data
- Packages

## Discussion

- Standardizing ICES web services
- Other topics

# Web services



## What are web services?

Web services run on the web and allow one application to speak to another without the need for pressing a button

Special URL that returns data from a database

## How to use web services

Can be called from all sorts of applications, including R

## Why use web services?

Easiest way to get current data from ICES databases directly into R

Entry point to script a fully documented reproducible analysis, encapsulating the workflow from raw data to end results

# ICES web services

related to the Transparent Assessment Framework



**DATRAS** – trawl surveys

<https://datras.ices.dk/WebServices/DATRASWebService.asmx>

**SAG** – stock assessment graphs

<https://sg.ices.dk/StandardGraphsWebServices.asmx>

**SLD** – stock list database

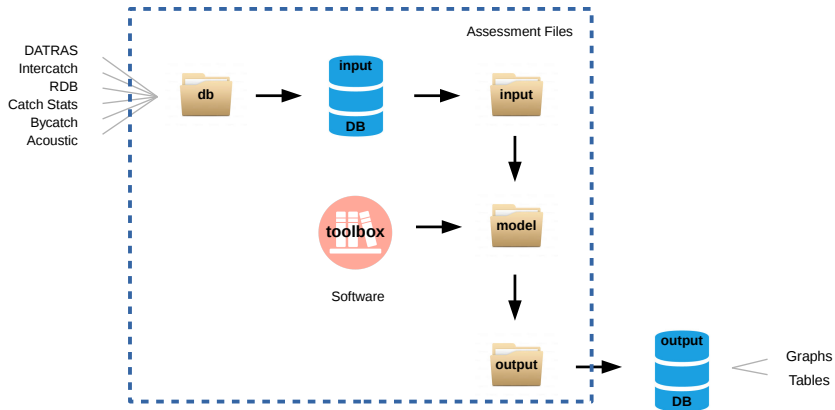
<http://sld.ices.dk/services>

**Vocab** – reference codes

<http://vocab.ices.dk/services/POX.aspx>

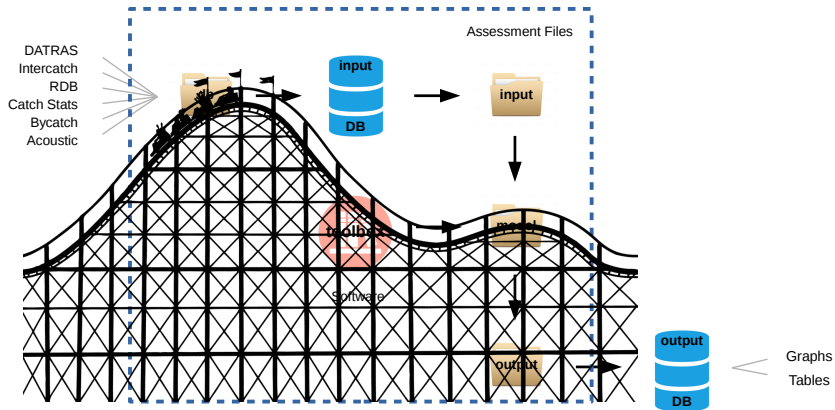
# TAF will use web services

to read input data



# TAF will use web services

to read input data



# Example

North Sea haddock



yay, data!

# DATRAS

click-click interface



Download

[If you have problems with downloading, click here](#)

|   |                         |  |
|---|-------------------------|--|
| <b>Data products</b><br>Exchange Data ▾<br><input checked="" type="checkbox"/> HH <input checked="" type="checkbox"/> HL <input checked="" type="checkbox"/> CA   | <b>Survey</b><br>BITS ▾ | <b>Quarter(s)</b><br><input checked="" type="checkbox"/> All <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 |
| <b>Year(s)</b><br><input checked="" type="checkbox"/> All <input checked="" type="checkbox"/> 1991 <input checked="" type="checkbox"/> 1992 <input checked="" type="checkbox"/> 1993 <input checked="" type="checkbox"/> 1994 <input checked="" type="checkbox"/> 1995 <input checked="" type="checkbox"/> 1996 <input checked="" type="checkbox"/> 1997 <input checked="" type="checkbox"/> 1998 <input checked="" type="checkbox"/> 1999 <input checked="" type="checkbox"/> 2000 <input checked="" type="checkbox"/> 2001<br><input checked="" type="checkbox"/> 2002 <input checked="" type="checkbox"/> 2003 <input checked="" type="checkbox"/> 2004 <input checked="" type="checkbox"/> 2005 <input checked="" type="checkbox"/> 2006 <input checked="" type="checkbox"/> 2007 <input checked="" type="checkbox"/> 2008 <input checked="" type="checkbox"/> 2009 <input checked="" type="checkbox"/> 2010 <input checked="" type="checkbox"/> 2011 <input checked="" type="checkbox"/> 2012 <input checked="" type="checkbox"/> 2013<br><input checked="" type="checkbox"/> 2014 <input checked="" type="checkbox"/> 2015 <input checked="" type="checkbox"/> 2016 |                         |  |
| <i>Only preliminary data for the latest year and quarter</i>  |                         |  |
| <b>Ship(s)</b><br><input checked="" type="checkbox"/> All <input checked="" type="checkbox"/> 26HF <input checked="" type="checkbox"/> ARG <input checked="" type="checkbox"/> ATL <input checked="" type="checkbox"/> ATLD <input checked="" type="checkbox"/> BAL<br><input checked="" type="checkbox"/> BALL <input checked="" type="checkbox"/> BPE <input checked="" type="checkbox"/> CEV <input checked="" type="checkbox"/> CLP <input checked="" type="checkbox"/> CLV <input checked="" type="checkbox"/> DIAN2<br><input checked="" type="checkbox"/> DANS <input checked="" type="checkbox"/> DAR <input checked="" type="checkbox"/> GDY <input checked="" type="checkbox"/> HAF <input checked="" type="checkbox"/> KOH <input checked="" type="checkbox"/> KOOT<br><input checked="" type="checkbox"/> MIM <input checked="" type="checkbox"/> MON <input checked="" type="checkbox"/> MONL <input checked="" type="checkbox"/> SOL <input checked="" type="checkbox"/> SOL2 <input checked="" type="checkbox"/> VSH<br><input checked="" type="checkbox"/> ZBA  |                         |  |
|   |                         |  |
|   |                         |  |

Submit

DOWNLOAD DATA PRODUCTS

UPLOAD SURVEY DATA

CONNECT TO WEBSERVICES

CONTACT US

## VIEW MORE

- DATRAS Documents
- DATRAS News and updates

## USEFUL LINKS

- Reporting Format
- Data submission deadlines
- Submission status
- World Register of Marine Species
- Species Query Tool
- R codes for DATRAS
- Metadata of the datasets
- Distribution maps
- ICES Data policy

Not useful for scripting...



The following operations are supported:

- [getCAdata](#)
- [getHHdata](#)
- [getHLdata](#)
- [getSurveyInsertDate](#)
- [getSurveyList](#)
- [getSurveyYearList](#)
- [getSurveyYearQuarterList](#)

## getCAdata

### Test

To test the operation using the HTTP POST protocol, click the 'Invoke' button.

| Parameter | Value                |
|-----------|----------------------|
| survey:   | <input type="text"/> |
| year:     | <input type="text"/> |
| quarter:  | <input type="text"/> |

[Invoke](#)

URL to get NS-IBTS survey data from 1965, quarter 1:

```
https://datras.ices.dk/WebServices/DATRASWebService.asmx/  
getCAdata?survey=NS-IBTS&year=1965&quarter=1
```

# Data formats

- XML, POX
- JSON
- CSV

# Using web services in R



1. Construct URL of interest

```
https://datras.ices.dk/WebServices/DATRASWebService.asmx/  
getCAdata?survey=NS-IBTS&year=1965&quarter=1
```

2. Send URL, read data object

3. Convert object to data frame

... unless it already is a data frame

# icesDatras

## R package



### Description

R interface to access the web services of the ICES (International Council for the Exploration of the Sea) DATRAS trawl database.

### Details

#### *Get dataset:*

|                        |                   |
|------------------------|-------------------|
| <code>getHHdata</code> | haul data         |
| <code>getHLdata</code> | length-based data |
| <code>getCadata</code> | age-based data    |
| <code>getDATRAS</code> | any data          |

#### *Overview of available data:*

|                                       |                              |
|---------------------------------------|------------------------------|
| <code>getSurveyList</code>            | surveys                      |
| <code>getSurveyYearList</code>        | years                        |
| <code>getSurveyYearQuarterList</code> | quarters                     |
| <code>getDatrasDataOverview</code>    | surveys, years, and quarters |

### Author(s)

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Scientific data analysis, TAF

Interactive session, batch mode

Scripts, functions, packages

# Reading data into R



Tabular text file (CSV)

XML

JSON

# ICES packages for web services



icesDatras

icesSAG

icesSLD

icesVocab

# Handling unusual data



NA

Whitespace

International characters



# Possible improvements



Select species from DATRAS, CSV format

Get survey indices (and other data products) from DATRAS into R

Commercial catch-at-age web services

[Data products could be provided using web service operators,  
or R functions somewhere]