

# ICES Web Services and R

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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

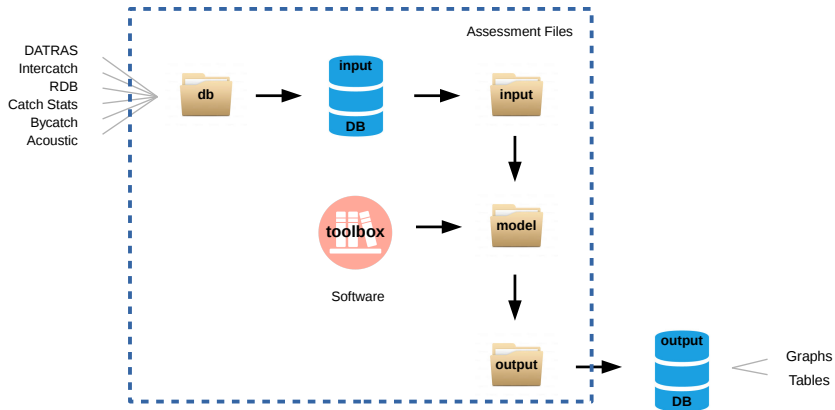
<http://sld.ices.dk/services>

**Vocab** – reference codes

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

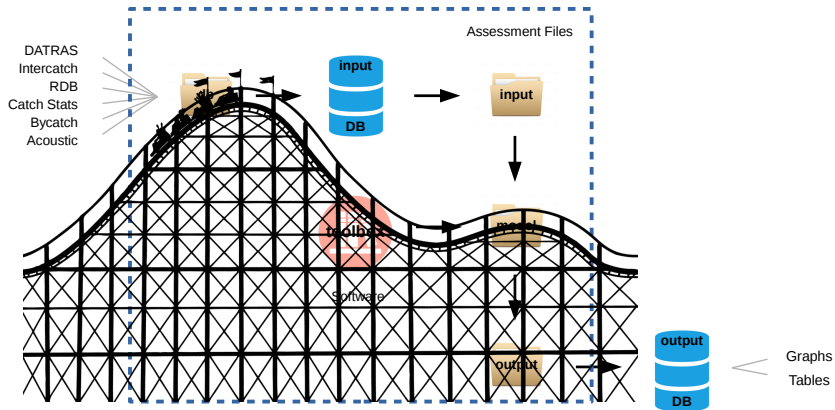
# TAF will use web services

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> Exchange Data <input checked="" type="checkbox"/> HH <input checked="" type="checkbox"/> HL <input checked="" type="checkbox"/> CA	<b>Survey</b> BITS	<b>Quarter(s)</b> 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> <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 <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 <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> <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 <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 <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 <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 <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



## **DATRAS**

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

## **SAG**

## **SLD**

<http://stocklist.ices.dk/services/odata4/StockListDWs4>

# 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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```
library(icesDatras)
getSurveyList()
getSurveyYearList("NS-IBTS")
getSurveyYearQuarterList("NS-IBTS", 1965)
getCAdata("NS-IBTS", 1965, 1)
getHHdata("NS-IBTS", 1965, 1)
getHLdata("NS-IBTS", 1965, 1)
getCatchWgt          function 22
getDATRAS             function 30
getDatastrasDataOverview function 9
getHHdata             function 6
getHLdata             function 6
getSurveyList         function 3
getSurveyYearList     function 4
getSurveyYearQuarterList function 4
```

# Data formats

- XML, POX
- JSON
- CSV

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