



Food and Agriculture  
Organization of the  
United Nations

# ICES web services for FIRMS

**FIRMS Steering Committee**

**10<sup>th</sup> SESSION**

**Copenhagen, Denmark, 20-24 June 2017**

*Relative to agenda item 8d*



# Outline

- ICES web services overview
- Harvesting data from ICES
- ICES stocks monitoring evolution
- Mapping ICES stock state indicators to FIRMS indicators
- Mapping ICES stock state indicators to FIRMS traffic light icons
- Producing and publishing ICES-FIRMS marine resource fact sheets

# ICES web services

## ➤ STOCK ASSESSMENT GRAPHS

<http://standardgraphs.ices.dk/webservices.aspx>

## ➤ STOCK DATABASE <http://sd.ices.dk/services/> (OData V4 Service – API)

➤ <http://sd.ices.dk/services/odata4/StockListDWs4>

## ➤ Vocabularies <http://vocab.ices.dk/>

➤ ICES\_StockCode : <http://vocab.ices.dk/?ref=357>



# Harvesting data from ICES

**ICES webservices** [\\_http://standardgraphs.ices.dk/webservices.aspx](http://standardgraphs.ices.dk/webservices.aspx)

- **Mapping ICES to FIRMS stocks** (StockKeyLabel to FIRMS internal IDs)  
<http://figisapps.fao.org/figis/website/xml/figis2ices-mapping.xml>
  - Generate a FIRMS web service upon the ICES web services  
<http://figisapps.fao.org/figis/moniker/icesliststocks>
- **Get list of all available stocks** {getListStocks(year)}  
<http://standardgraphs.ices.dk/StandardGraphsWebServices.asmx/getListStocks?year=0>
- **Get last Assessment Year available for each stock name**
- **Get the Stock Key for that specific assessment year** {getStockStatusValues(key)}  
<http://standardgraphs.ices.dk/StandardGraphsWebServices.asmx/getStockStatusValues?assessmentkey=7752>
- **Get the stock status table** {getStockStatusTable(key)}  
<http://standardgraphs.ices.dk/StandardGraphsWebServices.asmx/getStockStatusTable?assessmentkey=7919>
- **Get FishingPressureStatus (line1) and StockSizeStatus (line2)** (StandardGraphStockStatus per assessment key, 4 indicators are available: Maximum Sustainable Yield (line number 1); Precautionary Approach (line number 2); Management plan; Qualitative evaluation)

# Harvesting data from ICES

```

<root>
  <mapping figis="10342" ices="cod-icég" title="Icelandic Cod - Icelandic grounds"/>
  <mapping figis="10343" ices="had-icég" title="Icelandic Haddock - Icelandic grounds"/>
  <mapping figis="10344" ices="sai-icel" title="Icelandic Saithe - Icelandic grounds"/>
  <mapping figis="10345" ices="ghl-grn" title="Greenland halibut - Denmark Strait"/>
  <mapping figis="10348" ices="smr-5614" title="Redfish - North Western areas"/>
  <mapping figis="10351" ices="smn-con" title="Beaked Redfish - East Greenland and Icelandic Slope"/>
  <mapping figis="13434" ices="smn-sp" title="Beaked Redfish - Rockall Bank and Reykjanes Ridge (upper slope)"/>
  <mapping figis="13435" ices="smn-dp" title="Beaked Redfish - Rockall Bank and Reykjanes Ridge (deep slope)"/>
  <mapping figis="10353" ices="cap-icel" title="Capelin - Iceland, East Greenland and Jan Mayen area"/>
  <mapping figis="10352" ices="her-vasu" title="Herring - Iceland"/>
  <mapping figis="10327" ices="cod-arct" title="Cod - Barents Sea, Norwegian Sea, Spitzbergen and Bear Island"/>
  <mapping figis="10328" ices="cod-coas" title="Cod - Barents and Norwegian Seas (coastal waters)"/>

```

	Fishing pressure				Stock size					
	2013	2014	2015		2014	2015	2016			
Maximum Sustainable Yield	F <sub>MSY</sub>	✓	✓	✓	Appropriate	MSY B <sub>Trigger</sub>	✓	✓	✓	Above trigger
Precautionary Approach	F <sub>pa'</sub> F <sub>lim</sub>	✓	✓	✓	Harvested sustainably	B <sub>pa'</sub> , B <sub>lim</sub>	✓	✓	✓	Full reproductive capacity
Management plan	F <sub>MGT</sub>	✓	✓	✓	Below	B <sub>MGT</sub>	✓	✓	✓	Above

```

<StocksList>
  <AssessmentKey>7607</AssessmentKey>
  <StockKeyLabel>alf-comb</StockKeyLabel>
  <StockDatabaseID>787</StockDatabaseID>
  <StockKey>136482</StockKey>
  <StockDescription>Alfonsinos/Golden eye perch (Beryx spp.) in the Northeast Atlantic</StockDescription>
  <Status> Published </Status>
  <AssessmentYear>2016</AssessmentYear>
  <SpeciesName>Beryx</SpeciesName>
</StocksList>

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<ArrayOfStandardGraphStockStatus xmlns:xsd="http://www.w3.org/2001/XMLSchema"
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    <lineDescription>Maximum Sustainable Yield</lineDescription>
    <fishingPressure>F<sub>MSY</sub></fishingPressure>
    <YearStatus>
      <StandardGraphYearStatus>...</StandardGraphYearStatus>
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    </YearStatus>
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    <stockSizeStatus>Undefined</stockSizeStatus>
    <fishingPressureStatus>Undefined</fishingPressureStatus>

```

# ICES Stocks monitoring evolution

If for a stock name there are no updates, then the assessment unit might have evolved into another one(s) (different stock name)

- Check in the **ICES Stock Database** <http://sd.ices.dk/services> to identify stock renaming, new stocks and to monitor stock referencing evolution (split, merge)
- (Cross check with ICES list of Stock codes <http://vocab.ices.dk/?ref=357> – manual procedure)
- Update ICES – FIRMS stock IDs mapping
- Would it be possible to have integrated web service for this task?

<a href="#">her-2527</a>	Herring in Baltic Sub-divisions 25 to 27	<a href="#">ICES StockCode</a>	False	2013-10-17	2013-10-17
<a href="#">her-2532</a>	Herring in Sub-divisions 25 to 32	<a href="#">ICES StockCode</a>	False	2013-10-17	2013-10-23
<a href="#">her-2532-qor</a>	Herring in Subdivisions 25 - 29 (excluding Gulf of Riga) and 32	<a href="#">ICES StockCode</a>	False	2013-01-03	2013-01-03
<a href="#">her-2832</a>	Herring in Baltic Sub-divisions 28 to 32	<a href="#">ICES StockCode</a>	False	2013-10-17	2013-10-17
<a href="#">her-30</a>	Herring in Subdivision 30 (Bothnian Sea)	<a href="#">ICES StockCode</a>	False	2013-01-03	2013-01-03
<a href="#">her-31</a>	Herring in Subdivision 31 (Bothnian Bay)	<a href="#">ICES StockCode</a>	False	2013-01-03	2013-01-03
<a href="#">her-3a22</a>	Herring in Division IIIa and Subdivisions 22 - 24 (Western Baltic spring spawners)	<a href="#">ICES StockCode</a>	False	2013-01-03	2013-01-03
<a href="#">her-47d3</a>	Herring in Subarea IV and Divisions IIIa and VIIId (North Sea autumn spawners)	<a href="#">ICES StockCode</a>			
<a href="#">her-67bc</a>	Herring ( <i>Clupea harengus</i> ) in Divisions VIa and VIIb,c (West of Scotland, West of Ireland)	<a href="#">ICES StockCode</a>			

```
"StockDatabaseID": 1340,  
"StockKey": 169102,  
"StockKeyLabel": "gfb.27.nea",  
"StockKeyDescription": "Greater forkbeard (Phycis blennoides) in subareas 1-10, 12 and 14  
"PreviousStockKey": 1930,  
"PreviousStockKeyLabel": "gfb-comb",  
"ActiveYear": 2017,  
"SpeciesScientificName": "Phycis blennoides",  
"SpeciesCommonName": "Greater forkbeard",
```

# Mapping ICES stock state indicators to FIRMS indicators

- Map from StandardGraphStockStatus per assessment key to **FIRMS values**
  - From **MSY** (line number 1), map **FishingPressureStatus**
  - From **PA** (line number 2 ) map **StockSizeStatus**

ICES-FIRMS State and Trend Mapping Table (Updated September 2012)				
Exploitation Rate status				
FIRMS Descriptors	ICES Descriptors			
	MSY	PA	MP	Qualitative
No or low fishing mortality	✔ (much) below target	✔ F very low	✔ much below target or below limit	✔ If F is very low i.e. $F < \text{possible refpoints}$
Moderate fishing mortality	✔ Appropriate or below target	✔ Harvested sustainably $F \leq F_{pa}$ ○ Increased risk $F_{lim} > F > F_{pa}$	✔ Below target or below limit, At target or within target range	✔ If F is very low i.e. $F < \text{possible refpoints}$
High fishing mortality	✘ Above target	✘ Harvested unsustainably $F > F_{lim}$	✘ Above target or above limit	✘ If F is very high, higher than expected to be safe for the stock, i.e. $F > \text{any safe limit}$
Uncertain/Not assessed	Undefined OR Unknown ? No reference point; Stock status unknown	Undefined OR Unknown ? No reference point; Stock status unknown	N/A	?

ICES-FIRMS State and Trend Mapping Table (Updated September 2012)				
Stock Abundance status				
FIRMS Descriptors	ICES Descriptors			
	MSY	PA	MP	Qualitative
Pre-exploitation biomass or high abundance	✔ (high) above trigger	✔ Full reproductive capacity (very high)	✔ (high) above target/limit/trigger	✔
Intermediate abundance	✔ At trigger or above trigger	✔ Full reproductive capacity ✔ $SSB \geq B_{pa}$	✔ At or above target/limit/trigger	✔
Low abundance	✘ Below trigger	○ Increased risk $B_{lim} < B < B_{pa}$	✘ Below target/limit/trigger	✘
Depleted	✘ (much) below trigger	✘ Reduced reproductive capacity $SSB < B_{lim}$	✘ (much) below target/limit/trigger	✘
Uncertain/Not assessed	Undefined OR Unknown ? No reference point; Stock status unknown	Undefined OR Unknown ? No reference point; Stock status unknown	N/A	?

# Mapping ICES stock state indicators to FIRMS indicators

- Question: the ICES web service is returning values slightly different from the advice reports, is there a list of controlled terms and official labels? Do they change every year?

ICES-FIRMS State and Trend Mapping Table (Updated September 2012)

ICES-FIRMS State and Trend Mapping Table (Updated September 2012)				
Exploitation Rate status				
FIRMS Descriptors	ICES Descriptors			
	MSY	PA	MP	Qualitative
No or low fishing mortality	✔ (much) below target	✔ F very low	✔ much below target or below limit	✔ If F is very low i.e. $F < \text{possible refpoints}$
Moderate fishing mortality	✔ Appropriate or below target	Harvested sustainably ✔ $F \leq F_{pa}$ Increased risk ⚠ $F_{lim} > F > F_{pa}$	✔ Below target or below limit, At target or within target range	✔ If F is very low i.e. $F < \text{possible refpoints}$
High fishing mortality	✘ Above target	Harvested unsustainably ✘ $F > F_{lim}$	✘ Above target or above limit	✘ If F is very high, higher than expected to be safe for the stock, i.e. $F > \text{any safe limit}$
Uncertain/Not assessed	Undefined OR Unknown ? No reference point; Stock status unknown	Undefined OR Unknown ? No reference point; Stock status unknown	N/A	?

ICES-FIRMS State and Trend Mapping Table (Updated September 2012)


ICES-FIRMS State and Trend Mapping Table (Updated September 2012)				
Stock Abundance status				
FIRMS Descriptors	ICES Descriptors			
	MSY	PA	MP	Qualitative
Pre-exploitation biomass or high abundance	✔ (high) above trigger	✔ Full reproductive capacity (very high)	✔ (high) above target/limit/trigger	✔
Intermediate abundance	✔ At trigger or above trigger	Full reproductive capacity ✔ $SSB \geq B_{pa}$	✔ At or above target/limit/trigger	✔
Low abundance	✘ Below trigger	Increased risk ⚠ $B_{lim} < B < B_{pa}$	✘ Below target/limit/trigger	✘
Depleted	✘ (much) below trigger	Reduced reproductive capacity ✘ $SSB < B_{lim}$	✘ (much) below target/limit/trigger	✘
Uncertain/Not assessed	Undefined OR Unknown ? No reference point; Stock status unknown	Undefined OR Unknown ? No reference point; Stock status unknown	N/A	?



# Mapping ICES stock state indicators to FIRMS traffic light icons

ICES FIRMS State and Trend Mapping Table (Updated September 2012)













Exploitation Rate status				
FIRMS Descriptors	ICES Descriptors			
	MSY	PA	MP	Qualitative
No or low fishing mortality	✓ (much) below target	✓ F very low	✓ much below target or below limit	✓ If F is very low i.e. F < possible reference points
Moderate fishing mortality	✓ appropriate or below target	✓ F < F <sub>MSY</sub> Increased risk: ⚠ F <sub>lim</sub> > F > F <sub>MSY</sub>	✓ Below target or below limit, At target or within target range ✓ Harvested sustainably	✓ If F is very low i.e. F < possible reference points ⚠ If F is very high, higher than expected to be safe for the stock, i.e. F > any safe limit
High fishing mortality	✗ Above target	✗ F > F <sub>lim</sub>	✗ Above target or above limit	✗ If F is very high, higher than expected to be safe for the stock, i.e. F > any safe limit
Uncertain/Not assessed	Undefined OR Unknown ? No reference point; Stock status unknown	Undefined OR Unknown ? No reference point; Stock status unknown	N/A	?

State & Trend Descriptors			
	Partner	FIRMS	
Exploitation rate	F <sub>MSY</sub> : Above	High fishing mortality	
Abundance level	MSY B <sub>Trigger</sub> : Above trigger	Intermediate abundance	[?]

ICES FIRMS State and Trend Mapping Table (Updated September 2012)

Stock Abundance status				
FIRMS Descriptors	ICES Descriptors			
	MSY	PA	MP	Qualitative
Pre-exploitation biomass or high abundance	✓ (high) above trigger	✓ Full reproductive capacity (very high)	✓ (high) above target/limit/trigger	✓
Intermediate abundance	✓ At trigger or above trigger	✓ Full reproductive capacity ✓ SSB ≥ B <sub>pa</sub>	✓ At or above target/limit/trigger ✓ Harvested sustainably	✓
Low abundance	✗ Below trigger	⚠ Increased risk ⚠ B <sub>lim</sub> < B < B <sub>pa</sub>	✗ Below target/limit/trigger	✗
Depleted	✗ (much) below trigger	✗ Reduced reproductive capacity ✗ SSB < B <sub>lim</sub>	✗ (much) below target/limit/trigger	✗
Uncertain/Not assessed	Undefined OR Unknown ? No reference point; Stock status unknown	Undefined OR Unknown ? No reference point; Stock status unknown	N/A	?

**Disclaimer:** The FIRMS State and Trend Descriptors are qualitative indicators based on the stock status evaluation provided by the FIRMS Partners. The coloured icon aims to indicate the overall state of the marine resource in regard to the exploitation rate and abundance level matrix.

Exploitation Rate (FIRMS)	Abundance Level (FIRMS)			
	Pre-exploitation biomass or high abundance	Intermediate abundance	Low abundance	Depleted
High fishing mortality				
Moderate fishing mortality				
No or low fishing mortality				

# Producing and publishing ICES-FIRMS marine resource fact sheets

- **A semi-automated process with a validation step**
- **FIRMS internal workflow:**
  - Generate HTML table for all FIGIS IDs  
<http://figisapps.fao.org/figis/moniker.html/icesmap2table> (so far 136 fact sheets produced, new 44 ICES stocks not included)
  - Run Excel-to-XML converter tool with such table
  - Download ICES-FIRMS fact sheets integrated with reference data and other metadata from Reference Observations
  - Upload in FIRMS CMS for publishing workflow
  - **Validate and Publish**

# Producing and publishing ICES-FIRMS marine resource fact sheets


**Marine Resource Fact Sheet** Search Print PDF XML

ICES Advice 2016  
**Sole - Celtic Sea**  
*Sole in Divisions VIII.g (Celtic Sea)* Citation

Owned by International Council for the Exploration of the Sea (ICES) – More

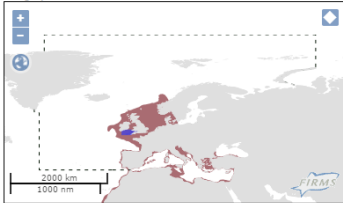
Related observations Locate in inventory

Species: *Solea solea*



FAO Names: en - Common sole, fr - Sole commune, es - Lenguado común, zh - 欧洲鳎

Geographic extent of Sole - Celtic Sea



Map legend Area Details

**Main Descriptors**  
Considered a single stock: Yes Spatial Scale: Sub-Regional  
Management unit: Yes Reference year: 2016

**Table of Contents**  
Habitat and Biology - Water Area Overview - Biological State and Trend - Source of information

## Biological State and Trend

State & Trend Descriptors			
	Partner	FIRMS	
Exploitation rate	$F_{MSY}$ : Above	High fishing mortality	
Abundance level	$MSY B_{Trigger}$ : Above trigger	Intermediate abundance	[?]

	Fishing pressure			Stock size		
	2013	2014	2015	2014	2015	2016
Maximum Sustainable Yield	$F_{MSY}$			MSY $B_{Trigger}$		
Precautionary Approach	$F_{PA}$ $F_{lim}$			$B_{PA}$ $B_{lim}$		
Management plan	$F_{MGT}$	-	-	$B_{MGT}$	-	-
			Above		Above trigger	Full reproductive capacity
			Harvested sustainably		Full reproductive capacity	Not applicable

## Habitat and Biology

Depth zone: Shelf (50 m - 200 m). Vertical distribution: Demersal/Benthic.

## Water Area Overview

Spatial Scale: Sub-Regional

Geo References Geo

## Resource Structure

Considered a single stock: Yes

## Management

Management unit: Yes

## Source of information

ICES Advice accessed through ICES Stock Assessment Database on Jun 2017. ICES, Copenhagen.


**Marine Resource Fact Sheet** Search Print PDF XML

ICES Advice 2016  
**Icelandic Haddock - Icelandic grounds**  
*Haddock in Division Va (Icelandic haddock)* Citation

Owned by International Council for the Exploration of the Sea (ICES) – More

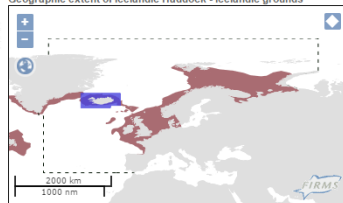
Related observations Locate in inventory

Species: *Melanogrammus aeglefinus*



FAO Names: en - Haddock, fr - Eglefin, es - Eglefino, zh - 黑线鳕, ru - Пикша

Geographic extent of Icelandic Haddock - Icelandic grounds



Map legend Area Details

**Main Descriptors**  
Considered a single stock: Yes Spatial Scale: Sub-Regional  
Management unit: Yes Reference year: 2016

**Table of Contents**  
Habitat and Biology - Water Area Overview - Biological State and Trend - Source of information

## Biological State and Trend

State & Trend Descriptors			
	Partner	FIRMS	
Exploitation rate	$F_{MSY}$ : Appropriate	Moderate fishing mortality	
Abundance level	$MSY B_{Trigger}$ : Undefined	Not applicable	[?]

	Fishing pressure			Stock size		
	2013	2014	2015	2014	2015	2016
Maximum Sustainable Yield	$F_{MSY}$			MSY $B_{Trigger}$		
Precautionary Approach	$F_{PA}$ $F_{lim}$			$B_{PA}$ $B_{lim}$		
Management plan	$F_{MGT}$			$B_{MGT}$		
			Appropriate		Undefined	Full reproductive capacity
			Harvested sustainably		Full reproductive capacity	Not applicable
			Below		Above	Not applicable

## Habitat and Biology

Depth zone: Shelf (50 m - 200 m). Vertical distribution: Demersal/Benthic.

## Water Area Overview

Spatial Scale: Sub-Regional

Geo References Geo

## Resource Structure

Considered a single stock: Yes

## Management

Management unit: Yes

## Source of information

ICES Advice accessed through ICES Stock Assessment Database on Jun 2017. ICES, Copenhagen.

# Producing and publishing ICES-FIRMS marine resource fact sheets

## Biological State and Trend

State & Trend Descriptors			
	Partner	FIRMS	
Exploitation rate	$F_{MSY}$ : Appropriate	Moderate fishing mortality	 [?]
Abundance level	$MSY B_{Trigger}$ : Undefined	Not applicable	

		Fishing pressure			Stock size					
		2013	2014	2015	2014	2015	2016			
Maximum Sustainable Yield	$F_{MSY}$	✓	✓	✓	Appropriate	$MSY B_{Trigger}$	?	?	?	Undefined
Precautionary Approach	$F_{pa}$ $F_{lim}$	✓	✓	✓	Harvested sustainably	$B_{pa}$ $B_{lim}$	✓	✓	✓	Full reproductive capacity
Management plan	$F_{MGT}$	✓	✓							

## Biological State and Trend

State & Trend Descriptors			
	Partner	FIRMS	
Exploitation rate	$F_{MSY}$ : Above	High fishing mortality	 [?]
Abundance level	$MSY B_{Trigger}$ : Above trigger	Intermediate abundance	

		Fishing pressure			Stock size					
		2013	2014	2015	2014	2015	2016			
Maximum Sustainable Yield	$F_{MSY}$	✗	✗	✗	Above	$MSY B_{Trigger}$	✓	✓	✓	Above trigger
Precautionary Approach	$F_{pa}$ $F_{lim}$	○	○	✓	Harvested sustainably	$B_{pa}$ $B_{lim}$	✓	✓	✓	Full reproductive capacity
Management plan	$F_{MGT}$	—	—	—	Not applicable	$B_{MGT}$	—	—	—	Not applicable

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Merci

Thank You

Благодарю

¡Muchas Gracias!