



Food and Agriculture  
Organization of the  
United Nations



General Fisheries Commission  
for the Mediterranean  
Commission générale des pêches  
pour la Méditerranée

# Fisheries Stock Assessment in a Development Context

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# Overview

## 1. Background

- Fisheries science
- International collaboration, leadership

## 2. Stock Assessment

- Lead stock assessor
- Reviewer, other services

## 3. Development Context

- Capacity building
- Research collaboration



## 1. Background



# Arni Magnusson

Senior Biostatistician  
GFCM Secretariat – FAO

## Background

M.S. and Ph.D., University of Washington

Fish population dynamics

Fisheries management

Statistical models

International collaboration

National Fisheries Advisory Committee, Iceland

## ICES and FAO

2016–2020 ICES Professional Officer, data and assessments

2020–current FAO, Mediterranean & Black Sea

## Lecturer

United Nations University

Tech University Denmark

University of Iceland

ICES Training Courses



## 2. Stock Assessment



## Stock Assessments

- 2000 Icelandic cod
- 2001 Icelandic cod, NZ ling, NZ southern blue whiting
- 2002 Icelandic cod, NZ smooth oreo
- 2003 Icelandic cod, NZ smooth oreo
  
- 2010 Icelandic greater silver smelt
- 2011 Icelandic saithe, Icelandic herring
- 2012 Icelandic saithe, Greenland inshore cod
- 2013 Icelandic saithe, Greenland inshore cod, Icelandic slope redfish, NE Atlantic mackerel
- 2014 Icelandic saithe, Greenland inshore cod, Greenland halibut
- 2015 Icelandic saithe, Greenland inshore cod
- 2016 Icelandic saithe

# Reviewer

## Internal

- 2011–2016 Icelandic National Advisory Committee, 37 stocks
- 2016– Review of implementation of the ICES precautionary approach

## External

- 2010 ICES RGDEEP: alfonsinos, greater forkbeard, ling, orange roughy, red seabream
- 2012 ICES IBPNEW: North Sea turbot
- 2014 NOAA CIE: Gulf of Mexico king mackerel
- 2018 SPRFMO: Chilean jack mackerel
- 2019 ICES RGBFAS: Kattegat plaice
- ICES RGCSE: European seabass
- NAFO: Newfoundland 3Ps cod
- 2020 ICES WKGSS (Chair): greater silver smelt stocks

# Other Services

## Internal

- 2011–2015 Editor of MFRI annual report of assessments and advice for all stocks
- 2013 Review of research proposals and funding priorities at MFRI
- 2014–2016 Creator and maintainer of <https://data.hafro.is>, open science repository
- 2017– Contact between ICES/GFCM and the RAM Legacy Database

## External

- 2009– Member of ADMB Foundation and Core Development Team
- 2017 Chair of stock assessment session at ICES ASC
- 2017–2020 Chair of the ICES Methods Working Group
- 2018– Member of SPRFMO Scientific Committee





# Fisheries Science

## Methods

What makes fisheries data informative for stock assessment (Magnusson and Hilborn 2007)

Performance of uncertainty methods in stock assessment (Magnusson et al. 2013)

## Iceland

Population genetics of Icelandic cod (Jakobsdottir et al. 2011)

Influence of cod abundance and temperature on shrimp recruitment (Jonsdottir et al. 2013)

Remote sensing of chlorophyll in Icelandic waters (Gudmundsson et al. 2016)

## Other regions

Estuarine influence on survival rates of Pacific salmon (Magnusson and Hilborn 2003)

State of the world's fisheries (Hilborn et al. 2003)

Population ecology of North Sea turbot and brill (van der Hammen et al. 2013)

Stock status of offshore shrimp stocks of Bangladesh (Barua et al. 2018)



# Fisheries Science (cont.)

## Fisheries management

Identifying management actions that promote sustainable fisheries (Melnychuk et al. 2021)

Model design in tuna Regional Fishery Management Organizations (Sharma et al. 2020)



### 3. Development Context



# Work with Developing Countries

## Teaching

2014–current United Nations University Fisheries Training Programme (UNU-FTP)

- ▶ Stock assessment, data management

## Research

Supervising UNU-FTP fellows:

- ▶ Bangladesh - offshore shrimp stock assessment *Indian Journal of Fisheries*
- ▶ Dominica - data management, estimating catches
- ▶ Uganda - multispecies assessment, Lake Victoria

## Working Groups

- ▶ GFCM members include 14 developing countries, participating in stock assessment groups and other fisheries science/management activities



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