



MINOUW

SFS-09-2014

RIA •634495

Science, Technology, and Society Initiative to Minimize Unwanted Catches in European Fisheries

**WP6. Dissemination, Exploitation and
Communication**

**Deliverable 6.6 On-line course ware on the
sustainable use of natural resources**

Responsible beneficiary: 3 - UI

Contractual due date: month 36

Dissemination level: PUBLIC

Report Status: FINAL

Actual submission date: 13 February 2018 (month 36)

Authors: G. Stefánsson, E. Sturludottir, H. Frater, J. Lentin (UI)

Contact person:

Dr. F. Maynou

maynouf@icm.csic.es

<http://minouw-project.eu/>



Co-funded by the Horizon 2020
Framework Programme of the European Union



RESEARCH & INNOVATION

ID•634495

Executive Summary

This document reports progress and conclusions on deliverable D6.6, On-line courseware on the sustainable use of natural resources in the MINOUW project. The report describes the Minouw part of the educational resource at <http://www.tutor-web.net> which makes available teaching material directed to the target audience. The material is made available in the tutor-web as a course, under the heading "Ecosystem Approach to Fisheries Management".

The course will help to communicate and disseminate the Minouw results in the academic and educational fields, completes Task 6.5 and is thus appropriately aligned with WP6 as a whole.

This course consists of multiple tutorials, providing material and drills at various stages of development, on topics from prerequisite mathematics, statistics and programming, through general fish population dynamics to ecosystem-based approaches for assessing biological and economic effects of discards.

Table of Contents

1.	Introduction	3
2.	Current content of course on Ecosystem Approach to Fisheries Management	4
2.1.	From numbers through algebra to calculus and linear algebra.....	4
2.2.	Introduction to the Ecosystem Approach to Fisheries Management	5
2.3.	Ecological Considerations of EAFM	6
2.4.	Societal Considerations of EAFM	7
2.5.	Discard Considerations of EAFM	8
2.6.	Trade-offs	9
2.7.	EAFM Tools: Gadget	10
2.8.	EAFM Tools: EWE (Ecopath with ecosim)	12
2.9.	EAFM Tools: Atlantis	13
2.10.	Applying the EAFM	14
3.	Additional content, prerequisites on fish population dynamics and fisheries models	15
3.1.	Introduction to fish population dynamics.....	15
3.2.	Applied multiple linear regression	16
3.3.	Statistical stock assessment methods	16
3.4.	Modelling length at age and length distributions	17
3.5.	Principles of utilization: The precautionary approach	18
4.	Conclusions and discussions.....	19
5.	References	19

On-line course ware on the sustainable use of natural resources

1. Introduction

This document reports progress and conclusions on deliverable D6.6, On-line courseware on the sustainable use of natural resources in the MINOUW project. The report describes the structure of the MINOUW part of <http://www.tutor-web.net> making available existing teaching material directed to the target audience. The material is made available in the tutor-web as a course, under the heading "Ecosystem Approach to Fisheries Management". This course consists of multiple tutorials, providing material and drills at various stages of development, on topics from prerequisite mathematics, statistics and programming, through general fish population dynamics to ecosystem-based approaches for assessing biological and economic effects of discards.

The tutor-web system (Stefansson, 2004) has been developed to be a mobile-web system as described by Lentin *et al.* (2014). Within the tutor-web, courses consist of tutorials, which contain lectures. The hierarchy typically contains both material and drills on said material. The system has been used for teaching and educational research and has been demonstrated to enhance learning over and above general classroom instruction (Jonsdottir, 2017).

The system has been developed and enhanced so as to function in locations with unstable electricity and no Internet connection, both in remote areas (Stefansson, 2017) and even in isolated prisons (Njurai, 2017). The system uses a collection of methods to enhance student learning, from personalised drills through cryptocurrency rewards (Lentin and Stefansson, 2018).

The primary MINOUW course consists of the following tutorials, described in subsections of the following chapter:

From numbers through algebra to calculus and linear algebra

Introduction to the Ecosystem Approach to Fisheries Management

Ecological Considerations of EAFM

Societal Considerations of EAFM

Discard Considerations of EAFM

Trade-offs

EAFM Tools: Gadget

EAFM Tools: EWE (Ecopath with ecosim)

EAFM Tools: Atlantis

Applying the EAFM

In addition, MINOUW has participated in further developing the tutor-web educational system in order to make it more appropriate for the target audiences, as well as enhance some of the basic material in the following tutorials:

Introduction to fish population dynamics

Applied multiple linear regression

Statistical stock assessment methods

Modelling length at age and length distributions

Principles of utilization: The precautionary approach

Methods and applications for data-limited fisheries

2. Current content of course on Ecosystem Approach to Fisheries Management

2.1. From numbers through algebra to calculus and linear algebra

2.1.1. Purpose

Although a prerequisite, this tutorial is found as the last tutorial in <http://tutor-web.net/fish/fish610> and is composed of 33 lectures, consists of all the basics for a student to be able to comfortably take on general modelling tasks, whether in applied statistics or fishery science.

On the second day, on the 15th of July, the above listed participants met the president of the Cofradia de Roses (Mr. Toni Abad) and several other local fishermen to discuss and then see first-hand the solutions adopted in Roses to tackle the problem of the unwanted species and the reduction of discard.

Participants were made up by fishermen (25%), researchers (35%), decision makers (30%), and NGO representatives (10%).

2.1.2. Prerequisites

This is considered a graduate-level course. A sufficient prerequisite is a BS/BA degree in any topic.

2.1.3. Current content

The course material consists of 171 pages on topics starting with basic arithmetic, moving on through programming using the R statistical package, vector arithmetic, matrices, mathematical functions, statistics and probability (discrete and continuous distribution), derivatives, integrals and multivariate distributions.

From numbers through algebra to calculus and linear algebra (math612.0)
 by admin — last modified 2017-11-15 15:03 — [History](#)

Take a drill on Numbers, arithmetic and basic algebra [Download tutorial notes](#)

Lectures Literature Related courses Data files

- Show raw tutorial TeX
- Update tutorial PDF

Code	Name	Slide download	Num. slides	Num. questions
lecture110	Numbers, arithmetic and basic algebra	Download PDF	5	13
lecture120	Data vectors	Download PDF	5	11
lecture130	More on algebra	Download PDF	5	8
lecture140	Discrete random variables and the binomial distribution	Download PDF	7	6
lecture150	Functions	Download PDF	5	7
lecture160	Polynomials	Download PDF	6	10
lecture170	Simple data analysis in R	Download PDF	5	7
lecture180	Indices and the apply commands in R	Download PDF	6	5
lecture190	Functions of functions and the exponential function	Download PDF	6	9
lecture195	Inverse functions and the logarithm	Download PDF	6	9
lecture210	Continuity and limits	Download PDF	7	7
lecture220	Sequences and series	Download PDF	5	7
lecture230	Slopes of lines and curves	Download PDF	5	7
lecture240	Derivatives	Download PDF	8	7
lecture250	Applications of differentiation	Download PDF	6	7
lecture260	Integrals and probability density functions	Download PDF	6	7
lecture270	Principles of programming	Download PDF	8	8
lecture280	The Central Limit Theorem and related topics	Download PDF	3	7
lecture290	Miscellanea	Download PDF	3	7
lecture310	Multivariate probability distributions	Download PDF	0	7

Tutorial 1. From numbers through algebra to calculus and linear algebra

2.1.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill item is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a total of 235 drill items.

2.2. Introduction to the Ecosystem Approach to Fisheries Management

2.2.1. Purpose

This tutorial is found as the first tutorial in <http://tutor-web.net/fish/fish610> and is composed of 5 lectures, providing a very basic introduction to EAFM.

2.2.2. Prerequisites

This is considered a graduate-level tutorial. A sufficient prerequisite is a BS/BA degree in any topic.

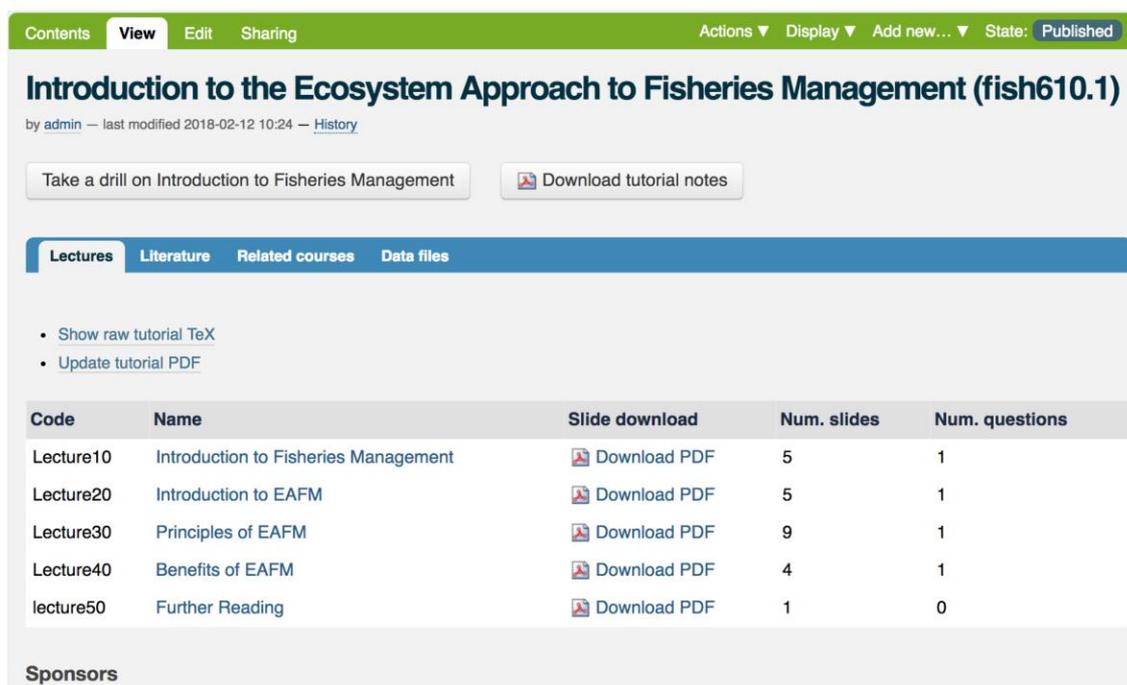
2.2.3. Current content

The material consists of 35 pages on topics starting with an introduction followed by the difference between single-species management and the ecosystem approach.

2.2.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill item is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a total of 4 drill items, which will be expanded as the tutorial is taught in a live classroom.



Code	Name	Slide download	Num. slides	Num. questions
Lecture10	Introduction to Fisheries Management	Download PDF	5	1
Lecture20	Introduction to EAFM	Download PDF	5	1
Lecture30	Principles of EAFM	Download PDF	9	1
Lecture40	Benefits of EAFM	Download PDF	4	1
lecture50	Further Reading	Download PDF	1	0

Tutorial 2. Introduction to the Ecosystem Approach to Fisheries Management

2.3. Ecological Considerations of EAFM

2.3.1. Purpose

This tutorial is found as a tutorial in <http://tutor-web.net/fish/fish610> and is composed of 4 lectures, providing an overview of the ecological consideration of the EAFM.

2.3.2. Prerequisites

This is considered a graduate-level tutorial and requires completion of the previous tutorials as well as a general introductory course on fish population dynamics and assessments.

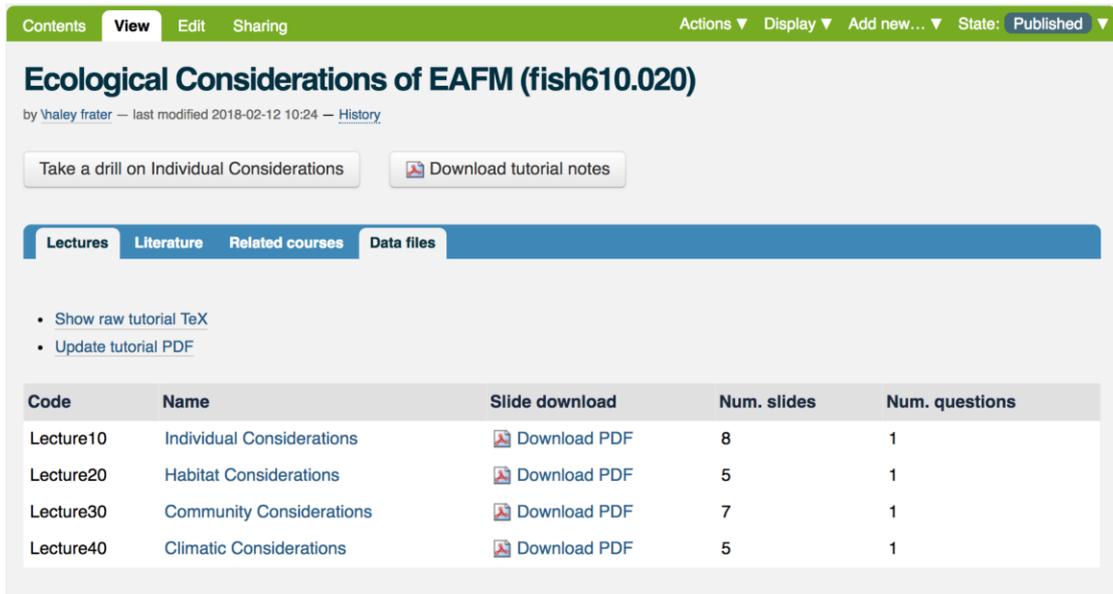
2.3.3. Current content

The material consists of 49 pages on the different considerations taken into account in the EAFM (e.g. habitat, community, climate).

2.3.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill item is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a total of 4 drill items, which will be expanded as the tutorial is taught in a live classroom



Code	Name	Slide download	Num. slides	Num. questions
Lecture10	Individual Considerations	 Download PDF	8	1
Lecture20	Habitat Considerations	 Download PDF	5	1
Lecture30	Community Considerations	 Download PDF	7	1
Lecture40	Climatic Considerations	 Download PDF	5	1

Tutorial 3. Ecological Considerations of EAFM

2.4. Societal Considerations of EAFM

2.4.1. Purpose

This tutorial is found as a tutorial in <http://tutor-web.net/fish/fish610> and is composed of 2 lectures, providing a very basic introduction to the societal considerations involved in the EAFM, including economics, stakeholders etc.

2.4.2. Prerequisites

This is considered a graduate-level tutorial and requires completion of the previous tutorials as well as a general introductory course on fish population dynamics and assessments.

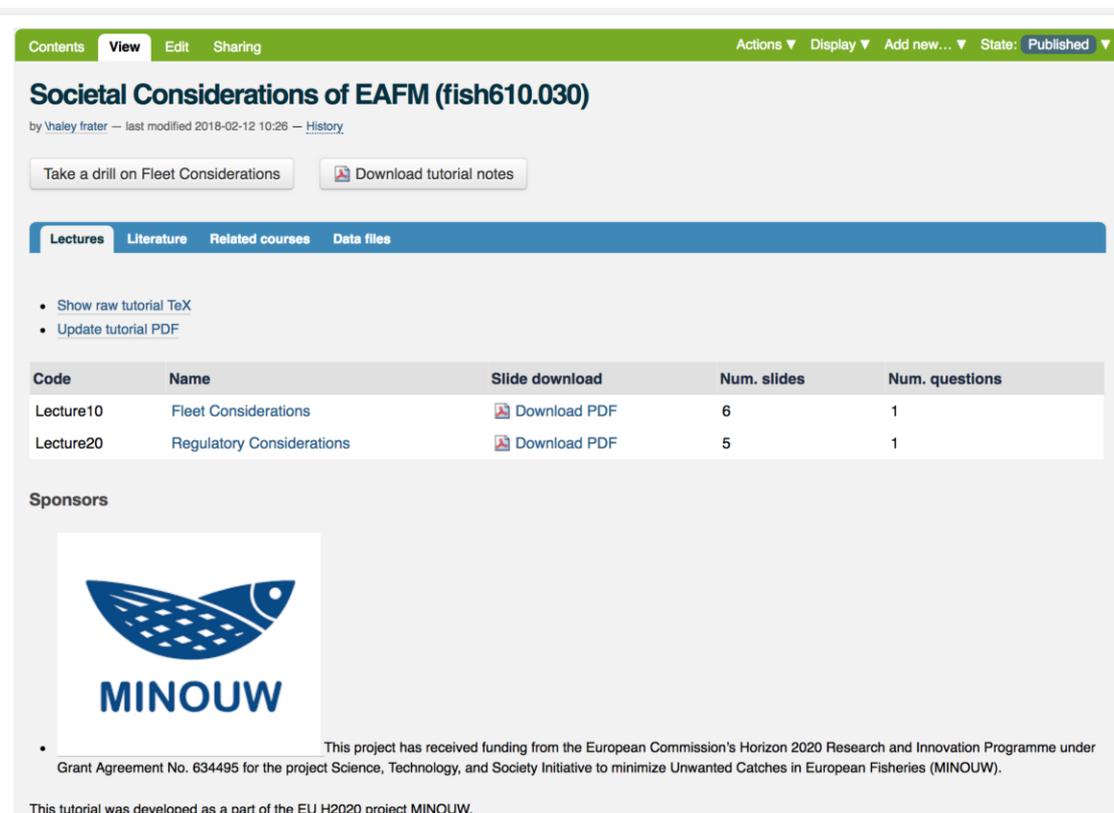
2.4.3. Current content

The material consists of 16 pages on the various societal aspects of an EAFM, covering fleets, economics, stakeholders and so forth.

2.4.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill item is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a total of 2 drill items, which will be expanded as the tutorial is taught in a live classroom.



The screenshot shows a web interface for a tutorial titled "Societal Considerations of EAFM (fish610.030)". At the top, there are navigation tabs: "Contents", "View", "Edit", and "Sharing". On the right, there are options for "Actions", "Display", "Add new...", and "State: Published". Below the title, there are two buttons: "Take a drill on Fleet Considerations" and "Download tutorial notes". A blue navigation bar contains "Lectures", "Literature", "Related courses", and "Data files". Under "Lectures", there are links for "Show raw tutorial TeX" and "Update tutorial PDF". A table lists two lectures:

Code	Name	Slide download	Num. slides	Num. questions
Lecture10	Fleet Considerations	Download PDF	6	1
Lecture20	Regulatory Considerations	Download PDF	5	1

Below the table, there is a "Sponsors" section with the MINOUW logo. A note states: "This project has received funding from the European Commission's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 634495 for the project Science, Technology, and Society Initiative to minimize Unwanted Catches in European Fisheries (MINOUW). This tutorial was developed as a part of the EU H2020 project MINOUW."

Tutorial 4. Societal Considerations of EAFM

2.5. Discard Considerations of EAFM

2.5.1. Purpose

This tutorial is found as a tutorial in <http://tutor-web.net/fish/fish610> and is composed of 7 lectures, providing an overview of how to view discards in an EAFM.

2.5.2. Prerequisites

This is considered a graduate-level tutorial and requires completion of the previous tutorials as well as a general introductory course on fish population dynamics and assessments.

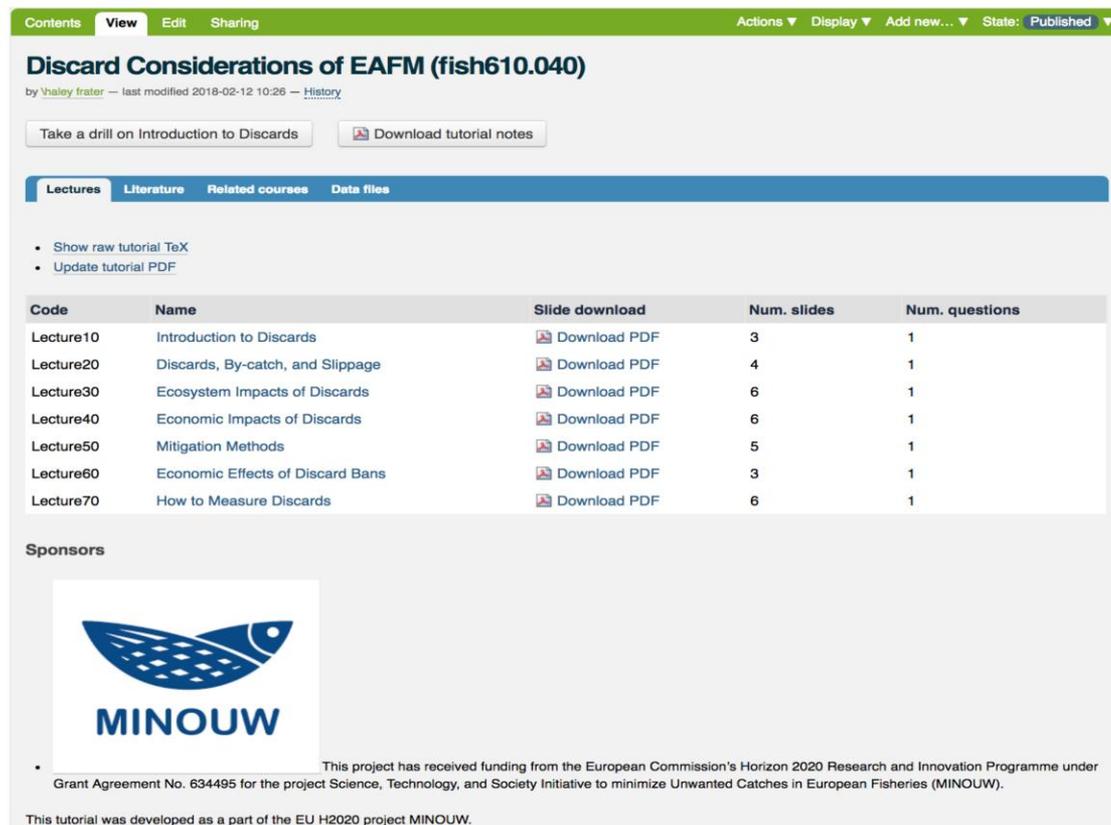
2.5.3. Current content

The material consists of 41 pages, going through the various discards issues such as economic and ecosystem impacts, mitigation measure and effects of discard bans.

2.5.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill item is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a total of 7 drill items, which will be expanded as the tutorial is taught in a live classroom.



The screenshot shows a web interface for a tutorial titled "Discard Considerations of EAFM (fish610.040)". The interface includes a navigation bar with "Contents", "View", "Edit", and "Sharing" options. Below the title, there are buttons for "Take a drill on Introduction to Discards" and "Download tutorial notes". A tabbed menu shows "Lectures" selected. A list of actions includes "Show raw tutorial TeX" and "Update tutorial PDF". A table lists the lectures with their codes, names, slide download links, and the number of slides and questions. The MINOUW logo is displayed, along with a note about funding from the European Commission's Horizon 2020 program.

Code	Name	Slide download	Num. slides	Num. questions
Lecture10	Introduction to Discards	Download PDF	3	1
Lecture20	Discards, By-catch, and Slippage	Download PDF	4	1
Lecture30	Ecosystem Impacts of Discards	Download PDF	6	1
Lecture40	Economic Impacts of Discards	Download PDF	6	1
Lecture50	Mitigation Methods	Download PDF	5	1
Lecture60	Economic Effects of Discard Bans	Download PDF	3	1
Lecture70	How to Measure Discards	Download PDF	6	1

Sponsors



This project has received funding from the European Commission's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 634495 for the project Science, Technology, and Society Initiative to minimize Unwanted Catches in European Fisheries (MINOUW).
This tutorial was developed as a part of the EU H2020 project MINOUW.

Tutorial 5. Discard Considerations of EAFM

2.6. Trade-offs

2.6.1. Purpose

This tutorial is found as a tutorial in <http://tutor-web.net/fish/fish610> and is composed of 4 lectures, providing an overview of the various trade-offs which need to be made within the EAFM.

2.6.2. Prerequisites

This is considered a graduate-level tutorial and requires completion of the previous tutorials as well as a general introductory course on fish population dynamics and assessments.

2.6.3. Current content

The material consists of 15 pages with sections on the ecological, economic and societal trade-offs involved.

2.6.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill item is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a total of 4 drill items, which will be expanded as the tutorial is taught in a live classroom.

Download PDF
 6 | 1 |
Lecture20
 Economic Trade-offs | [Download PDF](#) | 2 | 1 |
Lecture30
 Societal Trade-offs | [Download PDF](#) | 2 | 1 |
lecture40
 Further Reading | [Download PDF](#) | 1 | 1 |

Tutorial 6. Trade-offs

2.7. EAFM Tools: Gadget

2.7.1. Purpose

This tutorial is found as a tutorial in <http://tutor-web.net/fish/fish610> and is composed of 4 lectures, a small collection of slides providing an overview of the Gadget multispecies modelling environment.

The intent is to use these slides as a basis for a presentation on statistical approaches to multispecies models.

2.7.2. Prerequisites

This is considered a graduate-level tutorial and requires completion of the previous tutorials as well as a general introductory course on fish population dynamics and assessments.

2.7.3. Current content

The material consists of 48 pages on topics starting with an introduction, moving on through data collection, biological measurements, basic data analyses and statistical sampling schemes.

2.7.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill item is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a total of 4 drill items, which will be expanded as the tutorial is taught in a live classroom. The first such in-class course will be in Zaragoza, April 2018, when students will be given hands-on exercises on the differences between statistical and other multispecies models.

The question database will then become the most important part of this tutorial.

Download PDF

Lecture20
 Stock Assessment Models | [Download PDF](#) |Lecture30
 Fishing Fleet Models | [Download PDF](#) |Lecture40
 Multi-Species Models | [Download PDF](#) |

Contents **View** Edit Sharing Actions Display Add new... State: **Published**

EAFM Tools: Gadget (fish610.060)

by Vahley frater — last modified 2018-02-12 10:53 — [History](#)

Take a drill on Introduction to Gadget [Download tutorial notes](#)

Lectures Literature Related courses Data files

- Show raw tutorial TeX
- Update tutorial PDF

Code	Name	Slide download
Lecture10	Introduction to Gadget	Download PDF
Lecture20	Stock Assessment Models	Download PDF
Lecture30	Fishing Fleet Models	Download PDF
Lecture40	Multi-Species Models	Download PDF

Sponsors



This project has received funding from the European Commission's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 634495 for the project Science, Technology, and Society Initiative to minimize Unwanted Catches in European Fisheries (MINOUW).

This tutorial was developed as a part of the EU H2020 project MINOUW.

Tutorial 7. EAFM Tools: Gadget

2.8. EAFM Tools: EWE (Ecopath with ecosim)

2.8.1. Purpose

This tutorial is found as a tutorial in <http://tutor-web.net/fish/fish610> and will be composed of 5 lectures, providing a very basic introduction to EwE modelling. It is currently a placeholder.

2.8.2. Prerequisites

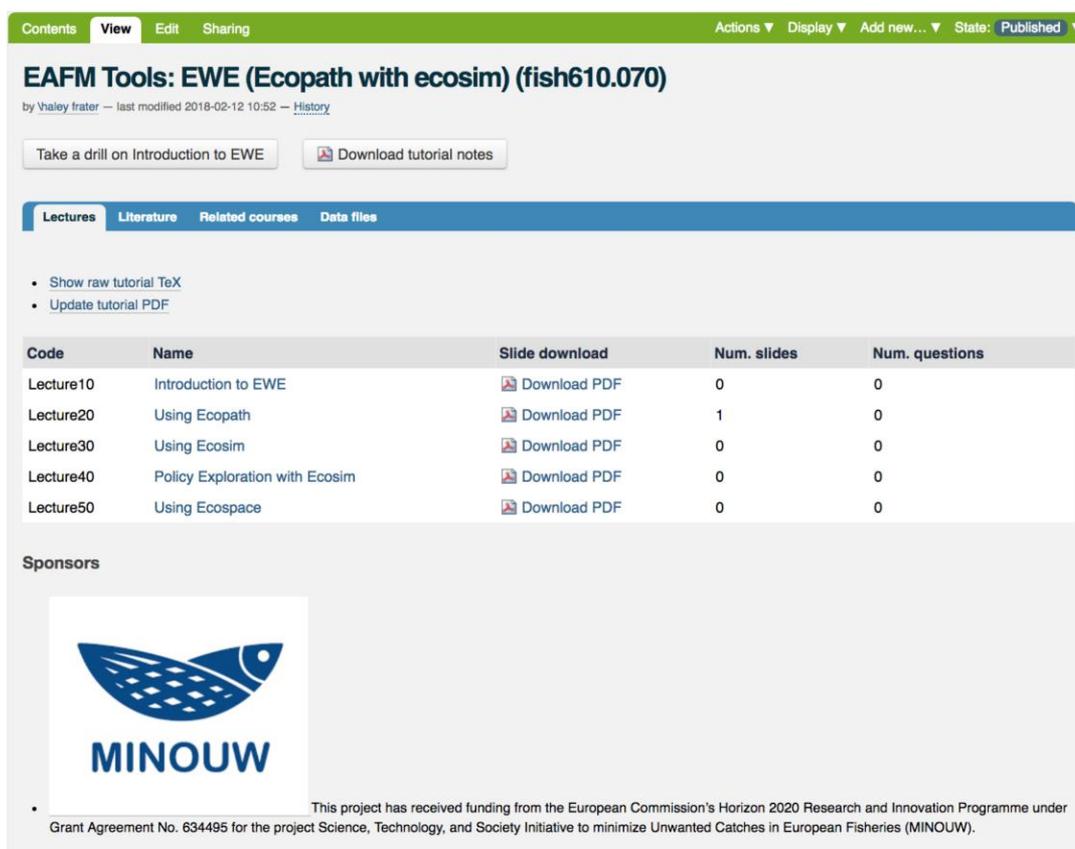
This will be considered a graduate-level tutorial and requires completion of the previous tutorials as well as a general introductory course on fish population dynamics and assessments.

2.8.3. Current content

The material consists of 48 pages on topics starting with an introduction, moving on through data collection, biological measurements, basic data analyses and statistical sampling schemes.

2.8.4. Drills

Each lecture will contain one or more drills on the topics of the lecture. Each drill item will be a multiple-choice question on the topics of the lecture.



Contents View Edit Sharing Actions Display Add new... State: Published

EAFM Tools: EWE (Ecopath with ecosim) (fish610.070)

by Vhaley frater — last modified 2018-02-12 10:52 — History

Take a drill on Introduction to EWE Download tutorial notes

Lectures Literature Related courses Data files

- Show raw tutorial TeX
- Update tutorial PDF

Code	Name	Slide download	Num. slides	Num. questions
Lecture10	Introduction to EWE	Download PDF	0	0
Lecture20	Using Ecopath	Download PDF	1	0
Lecture30	Using Ecosim	Download PDF	0	0
Lecture40	Policy Exploration with Ecosim	Download PDF	0	0
Lecture50	Using Ecospace	Download PDF	0	0

Sponsors



This project has received funding from the European Commission's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 634495 for the project Science, Technology, and Society Initiative to minimize Unwanted Catches in European Fisheries (MINOUW).

2.9. EAFM Tools: Atlantis

2.9.1. Purpose

This tutorial will be found as a tutorial in <http://tutor-web.net/fish/fish610> and is composed of 5 lectures, providing a fairly detailed overview of the Atlantis modelling tool.

2.9.2. Prerequisites

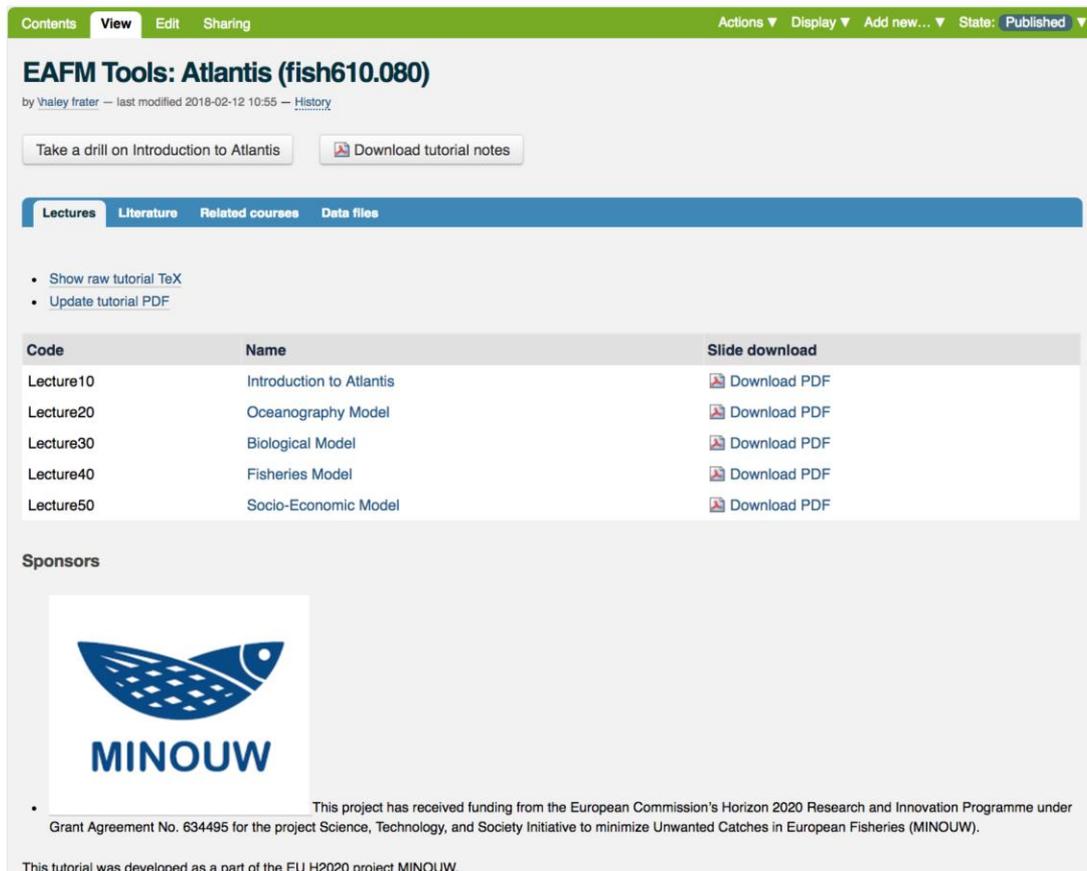
This is considered a graduate-level tutorial and requires completion of the previous tutorials as well as a general introductory course on fish population dynamics and assessments.

2.9.3. Current content

This is currently a placeholder.

2.9.4. Drills

Each lecture will contain one or more drills on the topics of the lecture. Each drill item will be a multiple-choice question on the topics of the lecture.



Contents View Edit Sharing Actions Display Add new... State: Published

EAFM Tools: Atlantis (fish610.080)

by [Vhaley frater](#) — last modified 2018-02-12 10:55 — [History](#)

Take a drill on Introduction to Atlantis [Download tutorial notes](#)

Lectures Literature Related courses Data files

- Show raw tutorial TeX
- Update tutorial PDF

Code	Name	Slide download
Lecture10	Introduction to Atlantis	Download PDF
Lecture20	Oceanography Model	Download PDF
Lecture30	Biological Model	Download PDF
Lecture40	Fisheries Model	Download PDF
Lecture50	Socio-Economic Model	Download PDF

Sponsors



This project has received funding from the European Commission's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 634495 for the project Science, Technology, and Society Initiative to minimize Unwanted Catches in European Fisheries (MINOUW).

This tutorial was developed as a part of the EU H2020 project MINOUW.

Tutorial 9. EAFM Tools: Atlantis

2.10. Applying the EAFM

2.10.1. Purpose

This tutorial is found as a tutorial in <http://tutor-web.net/fish/fish610> and is composed of 3 lectures, providing an introduction to the implementation of an EAFM.

2.10.2. Prerequisites

This is considered a graduate-level tutorial and requires completion of the previous tutorials as well as a general introductory course on fish population dynamics and assessments.

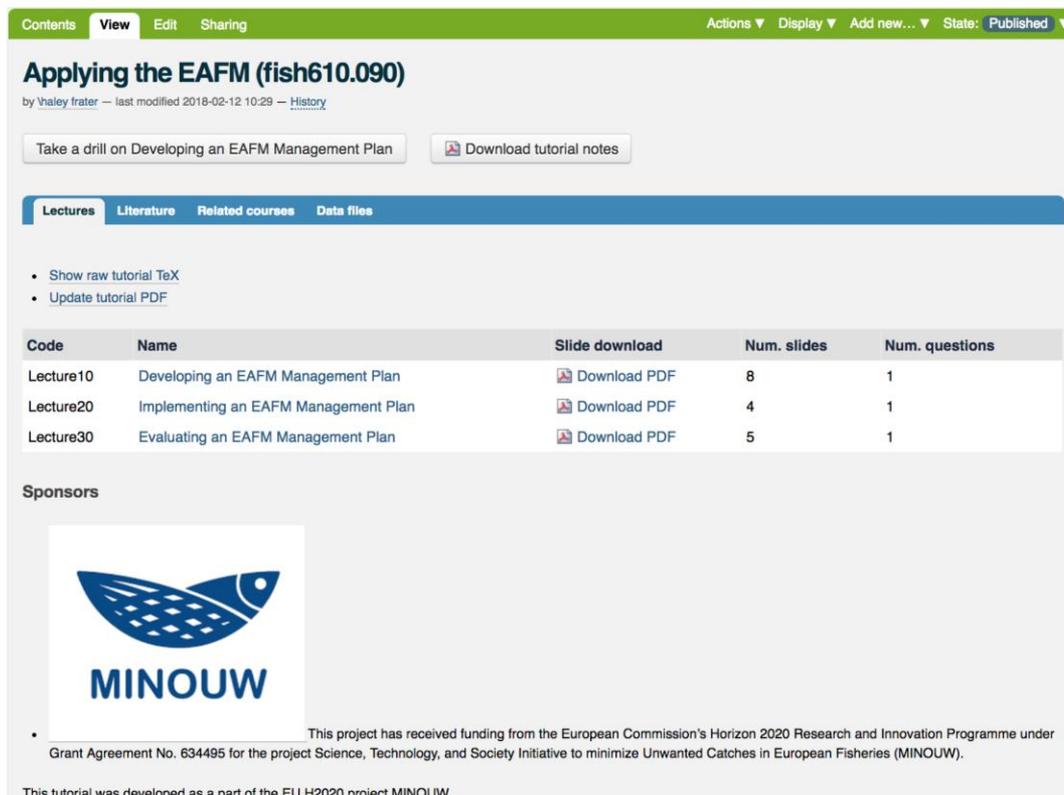
2.10.3. Current content

The material consists of 48 pages on topics starting with an introduction, moving on through data collection, biological measurements, basic data analyses and statistical sampling schemes.

2.10.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill item is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a total of 3 drill items, which will be expanded as the tutorial is taught in a live classroom.



The screenshot shows the interface for the tutorial "Applying the EAFM (fish610.090)". At the top, there are navigation tabs: "Contents", "View", "Edit", and "Sharing". On the right, there are options for "Actions", "Display", "Add new...", and "State: Published". Below the title, there are two buttons: "Take a drill on Developing an EAFM Management Plan" and "Download tutorial notes". A blue navigation bar contains "Lectures", "Literature", "Related courses", and "Data files". Under "Lectures", there are links for "Show raw tutorial TeX" and "Update tutorial PDF". A table lists the lecture content:

Code	Name	Slide download	Num. slides	Num. questions
Lecture10	Developing an EAFM Management Plan	Download PDF	8	1
Lecture20	Implementing an EAFM Management Plan	Download PDF	4	1
Lecture30	Evaluating an EAFM Management Plan	Download PDF	5	1

Below the table, there is a "Sponsors" section with the MINOUW logo. A note states: "This project has received funding from the European Commission's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 634495 for the project Science, Technology, and Society Initiative to minimize Unwanted Catches in European Fisheries (MINOUW). This tutorial was developed as a part of the EU H2020 project MINOUW."

Tutorial 10. Applying the EAFM

3. Additional content, prerequisites on fish population dynamics and fisheries models

3.1. Introduction to fish population dynamics

3.1.1. Purpose

This tutorial is found as the second tutorial in <http://tutor-web.net/fish/fish850> and is composed of 6 lectures, providing a very basic introduction to fishery science.

3.1.2. Prerequisites

This is a graduate-level tutorial and requires a BS/BSc degree.

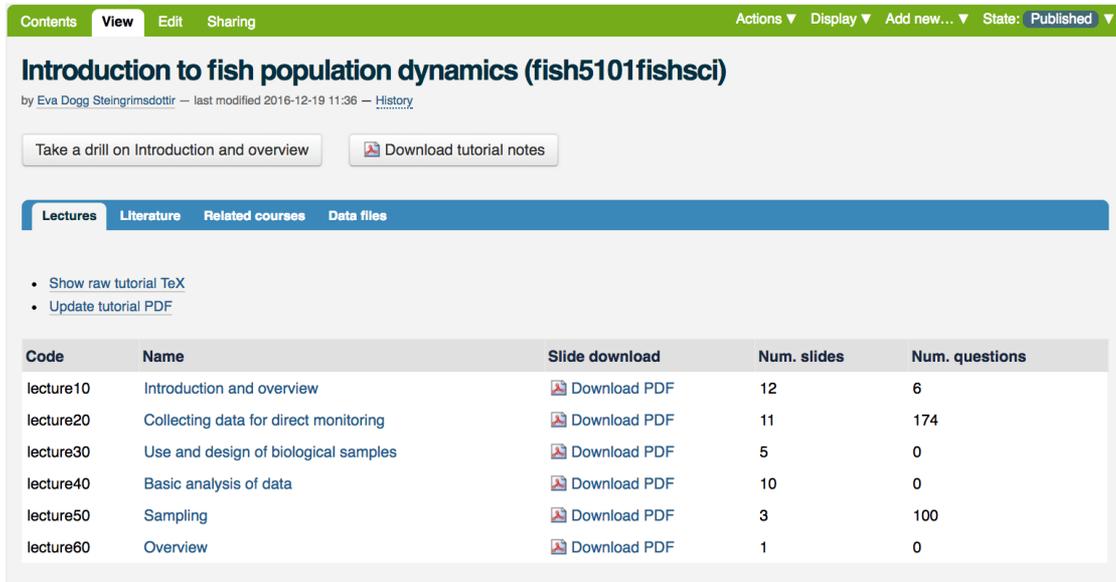
3.1.3. Current content

The material consists of 48 pages on topics starting with an introduction, moving on through data collection, biological measurements, basic data analyses and statistical sampling schemes.

3.1.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill item is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a total of 280 drill items.



Contents View Edit Sharing Actions Display Add new... State: Published

Introduction to fish population dynamics (fish5101fishsci)

by Eva Dagg Steingrimsdottir — last modified 2016-12-19 11:36 — History

Take a drill on Introduction and overview  Download tutorial notes

Lectures Literature Related courses Data files

- Show raw tutorial TeX
- Update tutorial PDF

Code	Name	Slide download	Num. slides	Num. questions
lecture10	Introduction and overview	 Download PDF	12	6
lecture20	Collecting data for direct monitoring	 Download PDF	11	174
lecture30	Use and design of biological samples	 Download PDF	5	0
lecture40	Basic analysis of data	 Download PDF	10	0
lecture50	Sampling	 Download PDF	3	100
lecture60	Overview	 Download PDF	1	0

Tutorial 2. Introduction to fish population dynamics

3.2. Applied multiple linear regression

3.2.1. Purpose

This tutorial is found as the third tutorial in <http://tutor-web.net/fish/fish850> and is composed of 5 lectures, providing important background to modelling by introducing the linear model in some detail. This forms an essential background for the nonlinear models used in fishery science.

3.2.2. Prerequisites

This is considered a graduate-level tutorial and requires completion of the previous tutorials.

3.2.3. Current content

The material consists of 21 pages on multiple linear regression using R.

3.2.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill item is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a total of 205 drill items.

Applied multiple linear regression (stats544-2-amulreg)

by admin — last modified 2014-09-18 10:49 — [History](#)

Take a drill on Multiple linear regression background  Download tutorial notes

Lectures | Literature | Related courses | Data files

- [Show raw tutorial TeX](#)
- [Update tutorial PDF](#)

Code	Name	Slide download	Num. slides	Num. questions
lecture30	Multiple linear regression background	 Download PDF	0	101
lecture40	Multiple linear regression	 Download PDF	0	101
lecture50	Deviations from assumptions	 Download PDF	0	1
lecture60	Extensions to the multiple linear regression model	 Download PDF	0	1
lecture70	Case studies	 Download PDF	0	1

Tutorial 3. Applied multiple linear regression

3.3. Statistical stock assessment methods

3.3.1. Purpose

This tutorial is found as the fourth tutorial in <http://tutor-web.net/fish/fish850> and is composed of 8 lectures, describing the basics methods for modelling fish population dynamics.

3.3.2. Prerequisites

This is considered a graduate-level tutorial and requires completion of the previous tutorials.

3.3.3. Current content

The course material consists of 30 pages on topics on general stock assessment methods, from dynamic bulk production models through age-based dynamic models, nonlinear fitting methods and case studies.

3.3.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a total of 200 drill items.

Statistical stock assessment methods (fish5108statass)
by Eva Dogg Steingrimsdottir — last modified 2016-12-19 11:41 — [History](#)

Take a drill on Statistical techniques for stock assessments [Download tutorial notes](#)

Lectures Literature Related courses Data files

- [Show raw tutorial TeX](#)
- [Update tutorial PDF](#)

Code	Name	Slide download	Num. slides	Num. questions
lecture10	Statistical techniques for stock assessments	Download PDF	3	99
lecture20	Production models	Download PDF	6	99
lecture30	Fitting criteria	Download PDF	6	0
lecture40	Formal statistical stock assessments in dynamic bulk production model	Download PDF	5	0
lecture50	Case studies of stock-production models	Download PDF	4	0
lecture60	Models with internal age structure	Download PDF	11	0
lecture70	Finicky details	Download PDF	5	0
lecture80	Some case studies	Download PDF	2	1

Tutorial 4. Statistical stock assessment methods.

3.4. Modelling length at age and length distributions

3.4.1. Purpose

This tutorial is found as the fifth tutorial in <http://tutor-web.net/fish/fish850> and is composed of 8 lectures, designed to move the students on from basic knowledge towards techniques applicable for modelling population dynamics for data limited fisheries.

3.4.2. Prerequisites

This is considered a graduate-level tutorial and requires completion of the previous tutorials.

3.4.3. Current content

The course material consists of 36 pages on topics starting with models to describe growth and length distributions, including population models based on length distributions as well as methods to extract cohort information from length distributions.

3.4.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill item is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a total of 34 drill items.

Modelling length at age and length distributions (fish5103growth)

by Eva Dagg Steingrimsdottir — last modified 2016-12-19 11:37 — [History](#)

Take a drill on Lack of age data - background
Download tutorial notes

Lectures
Literature
Related courses
Data files

- [Show raw tutorial TeX](#)
- [Update tutorial PDF](#)

Code	Name	Slide download	Num. slides	Num. questions
lecture10	Lack of age data - background	Download PDF	4	7
lecture20	Growth models	Download PDF	6	1
lecture30	Models of length distributions	Download PDF	13	6
lecture40	Case studies in analysis of length data	Download PDF	4	10
lecture50	Length-weight relationships	Download PDF	1	0
lecture60	Modelling the development of a length distribution	Download PDF	7	7
lecture70	Using length data in population models	Download PDF	2	1
lecture80	Using length data in population models	Download PDF	1	0

Tutorial 5. Modelling length at age and length distributions

3.5. Principles of utilization: The precautionary approach

3.5.1. Purpose

This tutorial is found as the sixth tutorial in <http://tutor-web.net/fish/fish850> and is composed of 4 lectures. These form a draft introduction to the precautionary approach and will be expanded during the project.

3.5.2. Prerequisites

This is considered a graduate-level tutorial and requires completion of the previous tutorials.

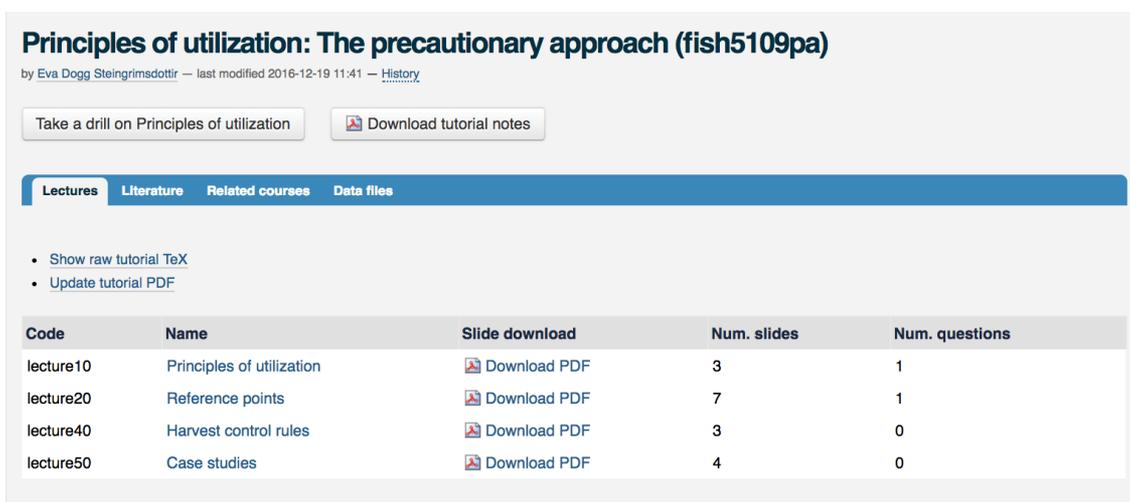
3.5.3. Current content

The material consists of 19 pages on the precautionary approach to utilising marine resources.

3.5.4. Drills

Each lecture contains one or more drills on the topics of the lecture. Currently each drill is a multiple-choice question on the topics of the lecture.

Currently the tutorial contains a placeholder of 2 drill items, to be expanded during the project.



The screenshot shows a web interface for a tutorial. At the top, the title is "Principles of utilization: The precautionary approach (fish5109pa)" by Eva Dógg Steingrimsdóttir, last modified 2016-12-19 11:41. Below the title are two buttons: "Take a drill on Principles of utilization" and "Download tutorial notes". A navigation bar includes "Lectures", "Literature", "Related courses", and "Data files". Below the navigation bar are two links: "Show raw tutorial TeX" and "Update tutorial PDF". A table lists the lecture content:

Code	Name	Slide download	Num. slides	Num. questions
lecture10	Principles of utilization	Download PDF	3	1
lecture20	Reference points	Download PDF	7	1
lecture40	Harvest control rules	Download PDF	3	0
lecture50	Case studies	Download PDF	4	0

Tutorial 6. Principles of utilisation: The precautionary approach

4. Conclusions and discussions

A course has been set up in accordance with the description of Deliverable 6.6. The course consists of tutorials required for a course on the ecosystem approach to fisheries management, with an emphasis and case study on the effects of discards.

Sufficient content has been added to the tutorials to use in a first in-class course, which will be given in Zaragoza in April, 2018. This course will be used as an opportunity to further enhance the material.

5. References

Jonsdóttir, A.H., Björnsdóttir, A. & Stefánsson, G. 2017. Difference in learning among students doing pen-and-paper homework compared to web-based homework. *J. Statistics Education*. DOI: 10.1080/10691898.2017.1291289

Lentin, J., Jonsdóttir, A.H., Stern, D., Mokuia V. and Stefánsson, G. 2014. A mobile web for enhancing statistics and mathematics education. First presented at icots9. See <http://arxiv.org/abs/1406.5004> (in prep).

Lentin, J. and Stefansson, G. (2018). From smileys to Smileycoins: Using a cryptocurrency for rewards in education. First presented at SIMC 2017 (submitted to Ledger)

Evelyn Njurai, Gunnar Stefansson, Anna Jónsdóttir, Patrick Mwenda, Mose Obonyo and Joseph Kariuki. 2017. Initial reflections on teaching and learning mathematics using tablet in a prison education centre. First presented at SIMC 2017 (accepted), Nairobi, Kenya.

Stefansson, G. (2004). The tutor-web: An educational system for class-room presentation, evaluation and self-study. *Computers & Education*, 43 (4), 315-343.

G. Stefansson, D.A. Stern, J. Lentin, A.H. Jonsdottir. 2017. Evidence-based technology to enhance mathematics education from Iceland to Kenya. Presented at SIMC 2017 (accepted), Nairobi, Kenya.

The MINOUW Consortium



Co-funded by the Horizon 2020
Framework Programme of the European Union



Beneficiaries:



Linked parties:

