



# ECASA NEWSLETTER

Issue 3

Autumn 2007

ECASA- An Ecosystem Approach for Sustainable Aquaculture – is an EU funded Framework 6 RTD project, with 16 research partners from 13 member states. It is the successor to several 4th and 5th Framework Programme projects which have helped to push forward our understanding of the effects of aquaculture on the environment especially in the Mediterranean.

## THE ECASA TOOLBOX

Available at [www.ecasatoolbox.org.uk](http://www.ecasatoolbox.org.uk)

The ECASA Toolbox is an innovative environmental management resource developed specifically for European marine aquaculture. The Toolbox has evolved over the course of the ECASA project with the aim to answer the needs of industry, regulators and environmental managers involved in marine aquaculture. The ECASA Toolbox is an internet based source of information on a range of tools that can be applied to shell-fish and fin-fish aquaculture, informing on Environmental Impact Assessment and effective site selection.

For information on the ECASA project go to <http://www.ecasa.org.uk>

### TOOLBOX CONTENTS

The ECASA Toolbox will provide information on procedures, assessment and regulation of European marine aquaculture.

#### Indicators

More than 50 indicators have been through the selection process. These indicators inform a range of environmental issues relating to the environmental impacts of aquaculture. There are also indicators which aim to describe the impact of the environment on aquaculture.

#### Models

A range of models have been tested in ECASA. These models may be used for predicting and managing farm impacts, or for estimating site, water-body or regional waste assimilative capacity or shell-fish carrying capacity.

## WORKING TOWARDS SUSTAINABILITY

Developing a framework for a sustainable industry.

Aquaculture is one of the fastest growing food producing sectors, and currently contributes just under 40% to world supplies of fish and other aquatic organisms. The benefits of this development are real and visible, both for producing countries (e.g. support for rural livelihoods, export earnings) and for consumers in the form of lower prices. Growing concern over the environmental impact of aquaculture, however, has prompted a search for a governance framework that can



ECASA Study Site, Kefhalonia, Greece.

# ECASA TOOLBOX INDICATORS

Indicators included in the Toolbox cover the range of environmental issues relating to the environmental impacts of European aquaculture. Each indicator is presented on an annotated sheet, available to download from the Toolbox as a pdf file. Information available from the sheets include which DPSIR class the indicator relates to, which ECASA partner proposed it, the data it requires and a summary of its scientific meaning and implementation. A range of validity is also given, along with recommendations for its application.

**Benthic Faunal indicators included in the ECASA Toolbox:** AMBI, Benthic Trophic Group, Biomass fractionation Index, ITI, Macro-fauna presence, Meio-fauna sediment test, Meio-faunal diversity, multi-variate indices, Uni-variate indices.

**Sediment indicators included in the ECASA Toolbox:** Ammonia in pore water, Carbon quality, Heavy metals, MUFAB, Nitrifer bacteria, Oxygen consumption fluxes, Phosphate in pore waters, Redox, Sediment flux, Sulphate and ammonia fluxes, Sulphide/oxygen probe, Total nitrogen, Total organic carbon (surface), Total organic carbon, Total phosphorus.

## Pelagic Indicators.

Pelagic indicators can be used to evaluate the effect of aquaculture on the surrounding environment and/or how the water quality around the farm affects aquaculture.

### Pelagic indicators included in the ECASA Toolbox:

Chlorophyll a, Maximum production while maintaining high water quality at the farm, Minimum oxygen in bottom waters, Particulate organic carbon in sea water, Secchi depth Winter nutrients.



Retrieving a sediment sample.  
Loch Creran, Scotland.

## Indicators which describe the impact of the environment on aquaculture.

Within ECASA special indicators were developed which aim to describe how the environment may impact aquaculture activities. The following indicators are proposed as having potential to indicate effective site selection and highlight the incompatibilities between aquaculture and anthropogenic activities.

Predator attack by birds, Predator attack by dolphins, Embayment degree (exposure), Frequency of storms, Distance from sources of pollution, Production of nearby farms, Predator attack by tuna, Wave height.

## Sustainability indicators.

To develop a framework for a sustainable industry, indicators must be developed to be able to measure the wider socio-economic costs and benefits of aquaculture. Indicators relating to sustainability issues and Coastal zone management have been evaluated in ECASA

**Socio-economic indicators:** Attitudes, Conflicts, Consumer prices, Consumption products, Consumption share, Damage costs, Employment, Income, Multiplier indicators of dependency, Output, Producer prices, Productivity ratios, Profit, Protection costs, Regional dependency ratios.

## Coastal Zone Management

**Indicators:** Aquashoreline, ASSETS, Validated distance, Water availability.

**Other Indicators.** Other indicators which do not fall into the categories given are those relating to genetic impacts, (DNA damage, DNA micro-satellites, EROD, mitochondrial DNA), and fish growth.

# ECASA TOOLBOX MODELS

Within ECASA models have been developed and tested to examine the relationships between the environment and aquaculture activities. Model testing (validation) compares predictions with observations and helps identify components sensitive to change. As well as defining the uses and benefits of a model, limitations must also be clearly defined for the model users and stakeholders.

In the Toolbox the details of the series of models tested by ECASA and recommended for use in predicting and managing farm impact or estimating size, water body or regional waste-assimilative capacity or shell fish carrying capacity is available. A detailed account of each model is presented related to its use, how to get the models and summarises the validation process.

A model descriptor is available to download from the Toolbox as a pdf file. This file gives a description of the model, relevant indicators, model status, implementation and testing.

Models have been tested in ECASA for salmon and cod farms in the Atlantic region, sea bass, sea bream, oyster and mussel farms, in the Mediterranean region.

The models included in the ECASA Toolbox are given below, along with the region they were tested in and the species involved.

Further information and recommendations on model performance and application is available in the Toolbox.

Further information on the ECASA project objectives and aims is available at [www.ecasa.org.uk](http://www.ecasa.org.uk)



**Oyster trestles, France.**

Region	Species	Models tested
Atlantic	Salmon	DEPOMOD, AutoDEPOMOD, FjordEnv, LESV, MOM
	Cod	DEPOMOD, AutoDEPOMOD,
Mediterranean	Sea bass	TRIMODENA, KK3D BREAMOD MOM MERAMOD
	Sea Bream	TRIMODENA, KK3D BREAMOD MOM MERAMOD
	Tuna	TRIMODENA
	Oysters	EcoWin 2000, DEB, ShellSIM
	Mussels	EcoWin BRNS BREAMOD MG-IBM MGCC ShellSIM

# FURTHER RESOURCES AVAILABLE FROM THE ECASA TOOLBOX

**ECASA Study Site Reports.** During the ECASA Field Campaign of 2006 a range of study sites were selected to include the broad spectrum of European aquaculture by species type and culture method. For each of the study sites a report has been written, in the style of an Environmental Statement, resulting from an Environmental Impact Assessment. These reports are available to download from the Toolbox.

**ECASA Book of Protocols.** Prior to the Field Campaign agreement was reached on what was to be measured at each study site, and how it was to be measured. The range of protocols used in the field-work and subsequent analysis of samples was collected together in the ECASA Book of Protocols. These protocols are all available from the Toolbox.

**Supplemental information.** Throughout the Toolbox information relating to all aspects of EIA and regulation of European aquaculture is provided. There is advice on monitoring aquaculture, the socio-economic aspects of the industry, and how the Toolbox can best inform on effective EIA and appropriate site selection.



SCOTTISH  
ASSOCIATION  
for MARINE  
SCIENCE

The Coordination Team are based at the Scottish Association for Marine Science (SAMS) one of the oldest marine research institutions in the world and a centre of excellence for the study, education and promotion of marine science.

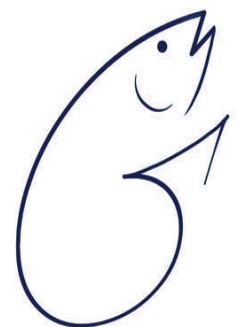


The EU's Research Framework Programme 6 contributes to the creation of a true "European Research Area" (ERA), which is a vision for the future of research in Europe, an internal market for science and technology. Fostering scientific excellence, competitiveness and innovation through the promotion of better co-operation and coordination between all levels. Economic growth increasingly depends on research, and the FP is the financial instrument that will help make the European Research Area a reality.



## ECASA Partner Contact Details

Partner	Contact	
Scottish Association for Marine Science, SAMS, UK	Kenneth D Black	ecasa@sams.ac.uk
Centre for the Economics and Management of Aquatic Resources, UOP, UK.	David Whitmarsh	david.whitmarsh@port.ac.uk
Napier University, NUE, UK.	Paul Tett	p.tett@napier.ac.uk
National Institute of Biology, NIB, Slovenia.	Alenka Malej	malej@mbss.org
Leibniz Institute of Marine Science, Kiel University, IFM-GEOMAR	Helmut Thetmeyer	hthetmeyer@ifm-geomar.de
Akvaplan Niva, Norway	Reinhold Fieler	rf@akvaplan.niva.no
University of Haifa, Israel	Dror Angel	adr@research.haifa.ac.il
University of Crete, UOC, Greece	Ioannis (Yannis) Karakassis	karakassis@biology.uoc.gr
Plymouth Marine Laboratory, PML, UK	Tony Hawkins	ajsh@pml.ac.uk
Institute of Marine Research, IMAR, Portugal	Joao Ferreira	joao@hoomi.com
Central Institute for Marine Research, ICRAM, Italy	Salvatore Porello	s.porello@icram.org
Institut Francais de Recherche pour l'Exploitation de la Mer, France	Alain Bodoy	Alain.Bodoy@ifremer.fr
Instituto Tecnológico Pesquero y Alimentario, AZTI, Spain	Ángel Borja	aborja@pas.azti.es
University of Venice, Italy	Roberto Pastres	pastres@unive.it
Rudjer Boskovic Institute, RBI, Croatia	Tarzan Legovic	legovic@irb.hr
University of Goteborg, Sweden	Anders Stigebrandt	anst@oce.qu.se



[www.ecasa.org.uk](http://www.ecasa.org.uk)

Contact details

Coordination Team

Kenny.Black@sams.ac.uk

Averil.Wilson@sams.ac.uk

ecasa@sams.ac.uk