ECASA – Ecosystem Approach for Sustainable Aquaculture

WAS
Florence
EU Projects on Sustainable Environment
Wednesday, May 10
15:10
Room 8

Partners
Objectives
Workpackages
Contact details

ECASA – Ecosystem Approach for Sustainable Aquaculture

SCOTTISH ASSOCIATION for MARINE SCIENCE

Project Co-ordinator-SAMS

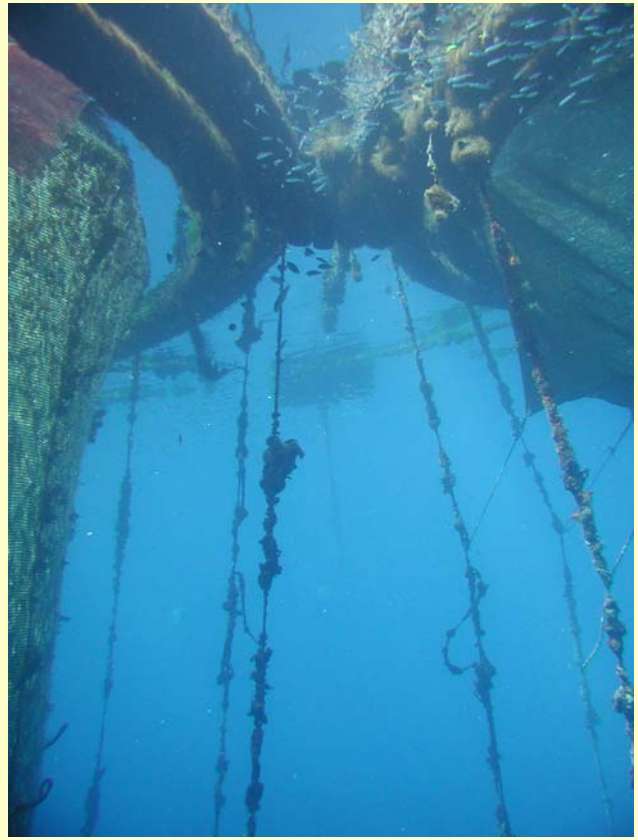
	Partner		Country
1	Scottish Association for Marine Science	SAMS	UK
2	Centre for the Economics and Management of Aquatic Resources	UOP	UK
3	Napier University	NNUE	UK
4	National Institute of Biology	NIB	Slovenia
5	Leibniz-Institute of Marine Science	IFM-GEOMAR	Germany
6	Akvaplan Niva	Akvaplan	Norway
7	University of Haifa	HAIFA	Israel
8	University of Crete	UOC	Greece
9	Plymouth Marine Laboratory	PML	UK
10	Institute of Marine Research	IMAR	Portugal
11	Central Institute for Marine Research	ICRAM	Italy
12	Institut Français de Recherche pour l'Exploitation de la Mer	IFREMER	France
13	Instituto Tecnológico Pesquero y Alimentario	AZTI	Spain
14	University of Venice	DCF_UNIVE	Italy
15	Rudjer Boskovic Institute	RBI	Croatia
16	University of Göteborg	UGOT	Sweden

Objectives

To identify quantitative and qualitative indicators of the effects of aquaculture on the environment and vice-versa, and to assess their applicability

To develop operational tools, including models, to establish and describe the relationship between environmental conditions and aquaculture activities over a range of ecosystems and aquaculture production systems.

To develop effective environmental impact assessment and site selection methods for coastal area management.



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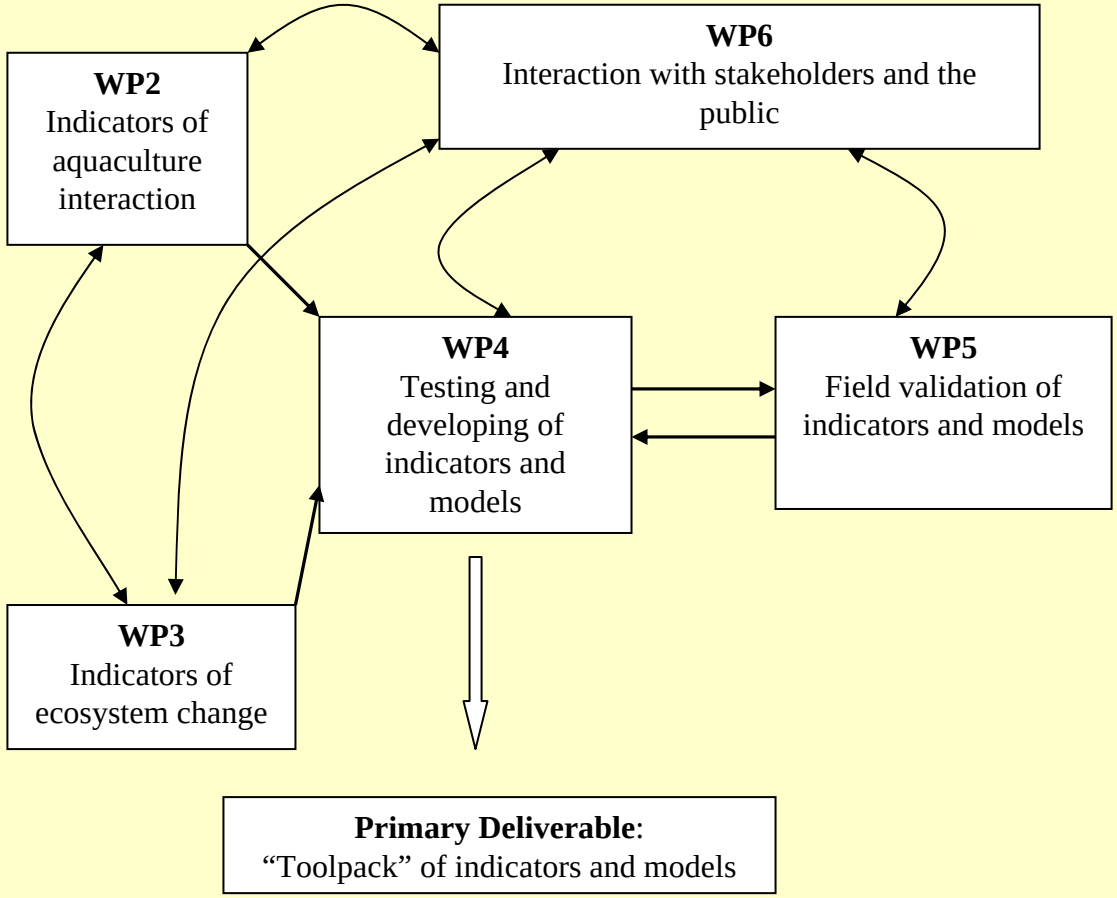


Graphical presentation of the components showing their interdependencies (straight lines) and information flow (additional curved lines)

WP2

Objectives

To establish a workable definition of indicators.

To identify the most relevant indicators of the impacts of aquaculture on ecosystems, including on other activities (fisheries grounds, sea-ranching) and interactions relating to issues of relevance to the Birds and Habitat Directives.

To identify indicators of socio-economics impact of aquaculture on coastal areas.

To classify the different indicators of positive or negative impact of aquaculture on ecosystems, with regards to the different types of aquaculture, their location and their environment.

To assess the interactions between aquaculture and other major uses of the coastal zone (fisheries, tourism & recreation, shipping etc)

Indicators of ecosystem change

53 indicators proposed, which were grouped into categories

-benthic fauna (AMBI, ITI...)

-sediment (sulphide, redox...)

-water quality (Chla, nutrients...)

-Coastal Zone management

Socio economic indicators

Objective	Indicator
Supply availability	Total output of aquaculture products by country or region Consumption of aquaculture products per capita Consumption of aquaculture products as a % of total fish consumption Consumer prices for aquaculture products
Livelihood security	Total employment in aquaculture by country or region Regional dependency ratios Income per capita in aquaculture Multiplier indicators of dependency
Economic efficiency	Productivity ratios Profit per unit Environmental damage costs per unit Environmental protection costs per unit Producer prices for aquaculture products
Social acceptability	**Public attitudes towards aquaculture development** Qualitative indicators of user conflict

WP3

Objectives

To identify and quantitatively assess the role and the relative importance of the different forcing factors: (aquaculture, fisheries, pollution, eutrophication, habitat destruction etc.) and environmental variations affecting the water quality in aquaculture zones and the major ecosystem services provided

To suggest the best methods for obtaining reference levels and associated indicators useful to monitor the impact of anthropogenic factors on aquaculture

To assess indicators of the interactions between aquaculture and other major uses of the coastal zone (fisheries, tourism & recreation, shipping etc)

To identify potential ways for measuring the additional cost caused by external environmental change

To identify indicators of incompatibilities between uses and/or minimal distances required to avoid conflicts over environmental issues

Insurance claims - Greece

GREECE	2001	2002	2003	2004	2005	Total	%
Disease	51	71	62	48	2	234	56
Storms	19	14	14	15	14	76	18
Predator Attack	9	11	13	6	0	39	9
Hatchery mortality	11	14	8	7	1	41	10
Transportation	6	5	4	1	1	17	4
Thermal inversion			3			3	1
Illegal actions	1			1		2	0
Equipment	2			1	1	4	1
Total	**99**	**115**	**104**	**79**	**19**	**416**	**100**

Insurance claims - Spain

SPAIN	2001	2002	2003	2004	Total	%
Storms	3	5	7	7	22	76
Disease			3		3	10
Predator Attack		1	1		2	7
Collision				1	1	3
Oil Spill		1			1	3
Total	**3**	**7**	**11**	**8**	**29**	**100**

WP4

Objectives

To assess the efficiency, cost effectiveness, robustness, reliability, practicality, feasibility, accuracy, and precision of aquaculture-environment interaction indicators identified in WP2 and WP3.

To develop operational tools, especially models, which capture the functional relationship between environment and aquacultural activities, and which embody the chosen indicators.

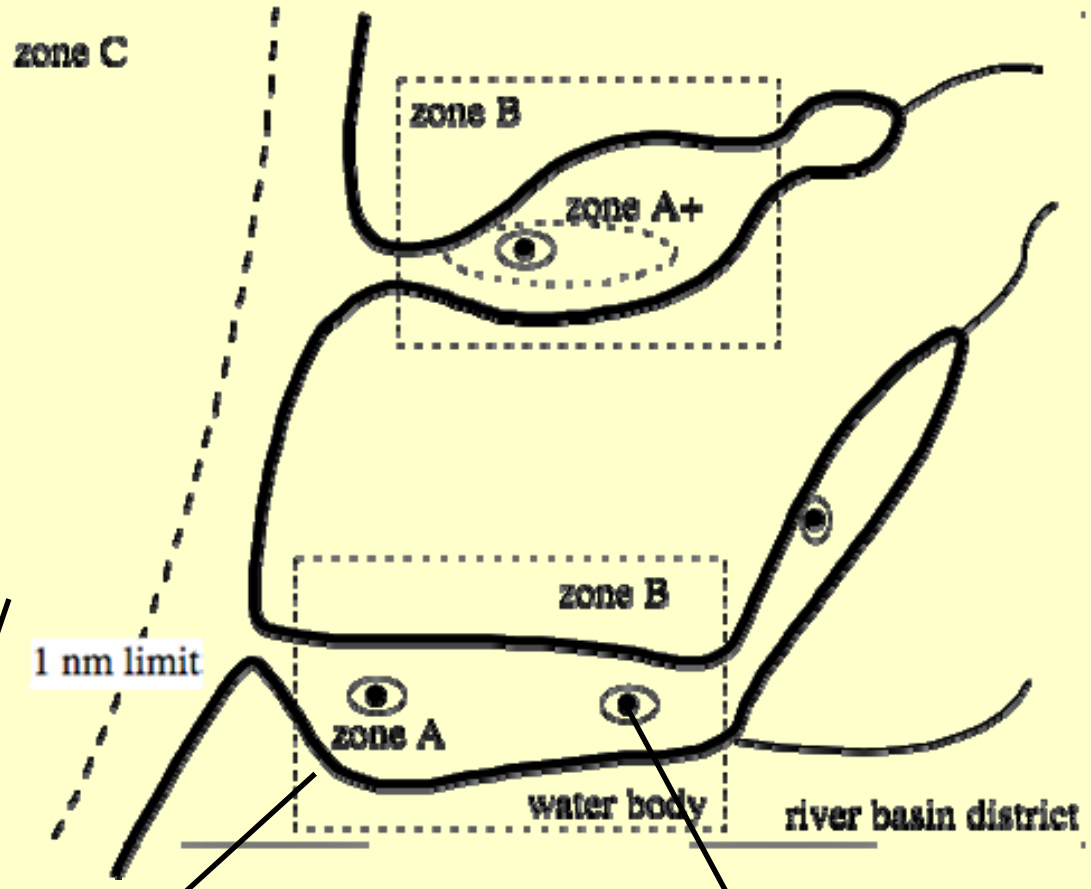
Scales

Environmental impact occurs, and assimilative and carrying capacities can be estimated, on 3 scales (defined by CSTT for urban waste water discharge, and shown here in relation to WFD):

A: local – benthic impact;

B: water body scale – basin assimilative capacity

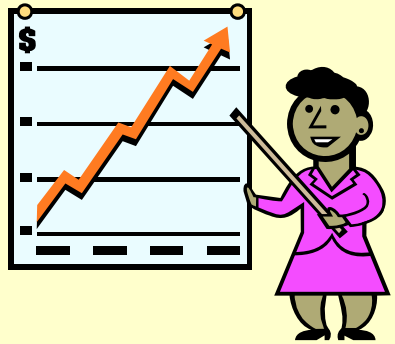
C: regional scale – e.g. Minch carrying capacity for aquaculture



ERSEM

CSTT

DEPOMOD



Issues for ECASA to address

relevance of models (e.g. DEPOMOD does not apply/should not be applied to rocky seabeds)

scientific **accuracy** of models - tests leading to rejection - studies leading to estimates of **precision** of prediction

system/procedure **appraisal**

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Models in WP4	reporter	owner/status
BRNS Early diagenesis model	Brigolin/ Pastres	Uni Venice
TRIMODENA-HYDRO	Julien Mader	AZTI (& LIM-Barcelona)
Hydrodynamic model (IFREMER-Hydro)	C. Bacher	IFREMER
FISH, FARM and SETTLE	Silvert	Canada
SETTLE 2	Silvert	Canada
RECOVERY	Silvert	Canada
DEPOMOD	Chris Cromey	SAMS/SEPA
TRIMODENA-LPT	Luis Ferrer	AZTI
CSTT eutrophication screening model	Paul Tett	CSTT/NUE/public domain
dCSTT+ and ESV models	Laurent, Tett	NUE and NUE/SAMS/FRS in development
FjordEnv	Anders Stigebrandt	UGOT
Effect of mussel longlines	C. Bacher	IFREMER
EcoWin 2000	Sequeria/ Ferreira	IMAR, widely used, freely available for research
ASSETS	Sequeria/ Ferreira	IMAR widely used; freely available
Shellfish 2005	Hawkins	in wide use by Hawkins
***Sparus aurata* individual-based model**	Brigolin/ Pastres	DCF-Unive
***Tapes philippinarum* individual-based model.**	Brigolin/ Pastres	DCF-Unive
Ecophysiological model based on DEB theory	Aline Gangnery	IFREMER
Shellfish production model	Aline Gangnery	IFREMER
Mass Balance Predictions of Finfish Waste	Strain, IOS, Sidney BC	open source; in use in Canada

WP5 Testing and validating these tools in order to include them in a methodology for Environment Impact Assessment (EIA) and effective site selection.

Objectives

To establish robust site selection criteria to maximise the utility of the work package.

To select suitable study sites for testing of the tools and indicators that are chosen in WP4

To carry out a series of field sampling campaigns that will generate a database of information that will enable evaluation of the tools and indicators by means of appropriate predictive models.

WP5 Field work 2007

Salmon

Cod

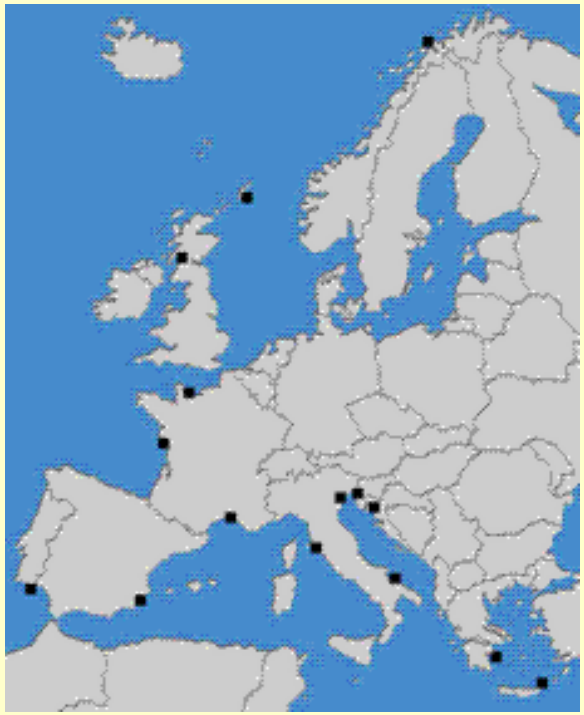
Mussels

Oysters

Sea Bass

Sea bream

Tuna



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16 farms, 9 countries, 10 species, 5 culture methods

Site Location	Species Cultivated	Cultivation Type
Norway	Salmon	Cages
Scotland	Salmon	Cages
Shetland	Cod	Cages
France – Brittany	Oysters	Trestle and pole
France - Normandy	Clams, oysters	Intertidal culture: bottom and trestles
France – South Coast	Oysters, Mussels	Suspended culture on tables
Spain	Sea bass, Sea bream, Tuna	Cages
Portugal	Clams, oysters	Intertidal culture: bottom and trestles
Italy – Gulf of Venice	Mussels	Long line
Italy - Bisceglie	Sea bass, Sea bream, Pandora	Cages
Italy – Porto Ercole	Sea bass, Sea bream, Shi drum	Cages
Croatia	Sea bass, Sea bream	Cages
Croatia	Oysters, Mussels	Long lines
Slovenia	Mussels	Long line
Slovenia	Sea bass, Sea bream	Cages
Greece	Sea bass, Sea bream	Cages

WP6 Dissemination

Objectives

To ensure effective dissemination of the project through producing effective public and private web-interfaces.

To ensure co-ordination of national meetings between stakeholders and participants and the 2 way flow of information.

To organise a **final international meeting of the project** between participants and stakeholders including organisations from outside the partner's countries and appropriate international bodies. (September 2007)

To co-ordinate the production of effective dissemination materials including newsletters

First 2 newsletters on ECASA Website - www.ecasa.org.uk

The ECASA 'Tool-pack'

The data collected and analysed during ECASA will test and select the final 'tool-pack' of models and indicators, including decision support tools to guide users to effective implementation

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