

The Sea Study Centre @ University of Genoa



UniGe

Centro del
Mare

The **Sea Study Centre** was established in April 2019 as a **Strategic Centre of UNIGE**, in order to:

- Catalyse **teaching and research activities** ongoing at UNIGE in various areas related to the sea
- Enforce **interdisciplinary** approaches, enhancing **internal synergies** and a **global external projection**
- Stimulate **external cooperations** with **Public Entities and Companies**
- Promote the role of **Genoa and of the Ligurian Region** as references **for the exploitation of Sea Values** on a national and international scale

The Sea Study Centre

- Education

- About **200 staff members** in the University of Genoa carry out teaching and research activities on Sea related topics. UNIGE ranks among the best Universities in the world on marine topics.
- UNIGE offers **5 bachelor and 7 master programs** directly related to the Sea with **more than 200 courses** on sea-related topics, with the largest educational offer dedicated to the Sea in Italy
- The PhD program in Marine Sciences and Technologies, active within the Sea Study Centre, offers more than **20 PhD positions** (scholarships) per year, being the largest in Italy on the subject.

Bachelor programs

- Product and nautical design
- Maritime Logistics and Transport Economics
- Pleasure Craft Design
- Naval Architecture and Marine Engineering
- Maritime Science and Technology (in English)

Master programs

- Marine biology and ecology
- Vessel and yacht design
- Maritime and port management
- Environmental Engineering (in English)
- Naval Architecture and Marine Engineering
- Safety Engineering for Transport Logistics and Production (in English)
- Yacht Design (in English)

PhD in Marine Sciences and Technology

- Logistics and transport
- Science of the marine ecosystem
- Marine and Nautical Design
- Energy machinery and systems for the sea
- Engineering for Marine and Coastal Environments
- Marine and Nautical Engineering / Marine technologies

Students Enrolled

Students Enrolled Academic Year 2022/23*							
Type of Course	Course	F	M	Total	% F	% M	
BACHELOR'S DEGREE	DESIGN FOR PRODUCTS AND NAUTICS	363	217	580	63%	37%	
BACHELOR'S DEGREE	NAUTICAL PRODUCT DESIGN	20	29	49	41%	59%	
BACHELOR'S DEGREE	ECONOMICS OF SHIPPING, LOGISTICS AND TRANSPORT COMPANIES	277	530	807	34%	66%	
BACHELOR'S DEGREE	NAUTICAL ENGINEERING	78	259	337	23%	77%	
BACHELOR'S DEGREE	SHIP ENGINEERING	112	335	447	25%	75%	
BACHELOR'S DEGREE	MARITIME SCIENCE AND TECHNOLOGY	12	59	71	17%	83%	
MASTER'S DEGREE	MARINE BIOLOGY AND ECOLOGY	75	42	117	64%	36%	
MASTER'S DEGREE	NAVAL AND NAUTICAL DESIGN	42	60	102	41%	59%	
MASTER'S DEGREE	MARITIME AND PORT MANAGEMENT	59	87	146	40%	60%	
MASTER'S DEGREE	ENVIRONMENTAL ENGINEERING	18	23	41	44%	56%	
MASTER'S DEGREE	NAVAL ARCHITECTURE & MARINE ENGINEERING	14	42	56	25%	75%	
MASTER'S DEGREE	SAFETY ENGINEERING FOR TRANSPORT, LOGISTICS AND PRODUCTION	15	40	55	27%	73%	
MASTER'S DEGREE	YACHT DESIGN	35	99	134	26%	74%	
	TOTAL	1,120	1,822	2,942	38%	62%	
	*update: 30/11/2022						

Graduates

Graduates Solar Year 2022*						
Type of Course	Course	F	M	Total graduates	% F	% M
BACHELOR'S DEGREE	DESIGN FOR PRODUCTS AND NAUTICS	52	39	91	57%	43%
BACHELOR'S DEGREE	ECONOMICS OF SHIPPING, LOGISTICS AND TRANSPORT COMPANIES	39	70	109	36%	64%
BACHELOR'S DEGREE	NAUTICAL ENGINEERING	12	35	47	26%	74%
BACHELOR'S DEGREE	SHIP ENGINEERING	11	16	27	41%	59%
BACHELOR'S DEGREE	MARITIME SCIENCE AND TECHNOLOGY	1	1	2	50%	50%
MASTER'S DEGREE	MARINE BIOLOGY AND ECOLOGY	21	7	28	75%	25%
MASTER'S DEGREE	SHIP AND NAUTICAL DESIGN	9	14	23	39%	61%
MASTER'S DEGREE	MARITIME AND PORT MANAGEMENT	17	28	45	38%	62%
MASTER'S DEGREE	ENVIRONMENTAL ENGINEERING	2	10	12	17%	83%
MASTER'S DEGREE	SHIP ENGINEERING	4	14	18	22%	78%
MASTER'S DEGREE	SAFETY ENGINEERING FOR TRANSPORT, LOGISTICS AND PRODUCTION	7	13	20	35%	65%
MASTER'S DEGREE	YACHT DESIGN	3	13	16	19%	81%
Total		178	260	438	41%	59%

*update: 31/11/2022

Employment rates

Employment percentages within 1 and 3 years since graduation			
Type of Course	Course	Percentage of students working within one year since graduation*	Percentage of students who continue their education*
BACHELOR'S DEGREE (270/2004)	PRODUCT AND NAUTICAL DESIGN	13,20%	100%
BACHELOR'S DEGREE (270/2004)	ECONOMICS OF SHIPPING, LOGISTICS AND TRANSPORT COMPANIES	47,80%	63,80%
BACHELOR'S DEGREE (270/2004)	MARINE ENGINEERING	29,60%	77,80%
BACHELOR'S DEGREE (270/2004)	NAVAL ENGINEERING	20,60%	88,20%
Type of Course	Course	Percentage of students working within one year since graduation*	Percentage of students working within three year since graduation*
MASTER'S DEGREE	NAVAL AND NAUTICAL DESIGN	71,40%	93,30%
MASTER'S DEGREE	MARITIME AND PORT MANAGEMENT	84,60%	100%
MASTER'S DEGREE	HYDROGRAPHY AND OCEANOGRAPHY (ex Scienze del mare)	50%	100%
MASTER'S DEGREE	NAVAL ENGINEERING	94,30%	91,10%
MASTER'S DEGREE	SAFETY ENGINEERING FOR TRANSPORT, LOGISTICS AND PRODUCTION	73,70%	100%
MASTER'S DEGREE	YACHT DESIGN	83,30%	96,90%

* Source: Survey 2020 Almalaurea: employment situation of graduates

Sea Study Centre - Research & Development

The Centre carries out research in the following Thematic Areas:

- Marine and Coastal Environment
- Marine Biology, Ecology and Biotechnology
- Sea and Maritime Law
- Coastal and Off-Shore Infrastructures
- Sea-going Vessels, Underwater Technology and Robotics
- Energy from the Sea
- Maritime Transport Networks, Logistics, and Port Economics
- Sports and Motion Recreational Activities at Sea
- History and Cultures of the Sea
- Sea Tourism and Cruises

Sea Study Centre

- Scientific and technical comitee

Marco Giovine (President)

Enrico Rizzuto (Vice President)

Marco Bove (DIMES)

Michele Lester (DINOOGMI)

Francesco D'Agostini (DISSAL)

Claudio Ferrari (DIEC)

Lorenzo Schiano di Pepe (DIGI)

Nicoletta Varani (DISFOR)

Giuliana Drava (DIFAR)

Giovanni Besio (DICCA)

Cesare Maria Rizzo (DITEN)

Luca Lo Basso (DISPI)

Paolo Calcagno (DAFIST)

Ana Lourdes De Hériz Ramon (DLCM)

Paola Francesca Rivaro (DICCI)

Paolo Prati (DIFI)

Mariachiara Chiantore (DISTAV)

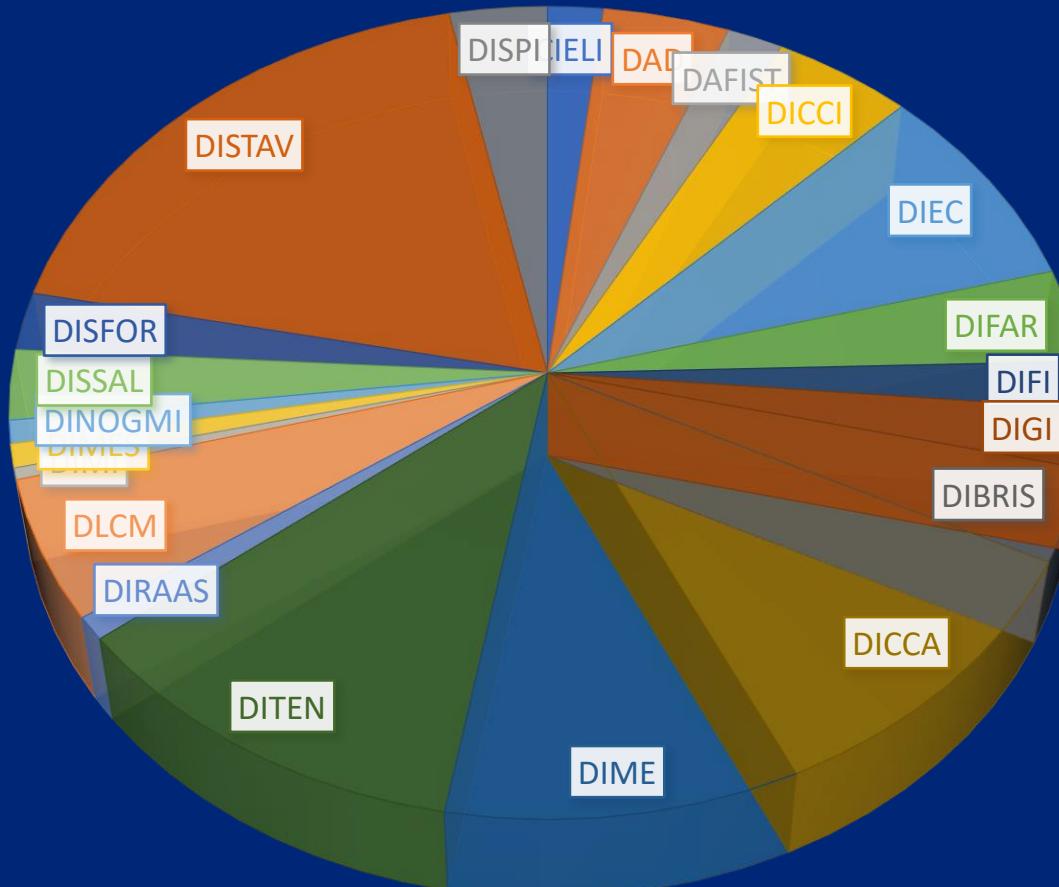
Giovanni Indiveri (DIBRIS)

Mario Ivan Zignego (DAD)

Giovanni Battista Rossi (DIME)

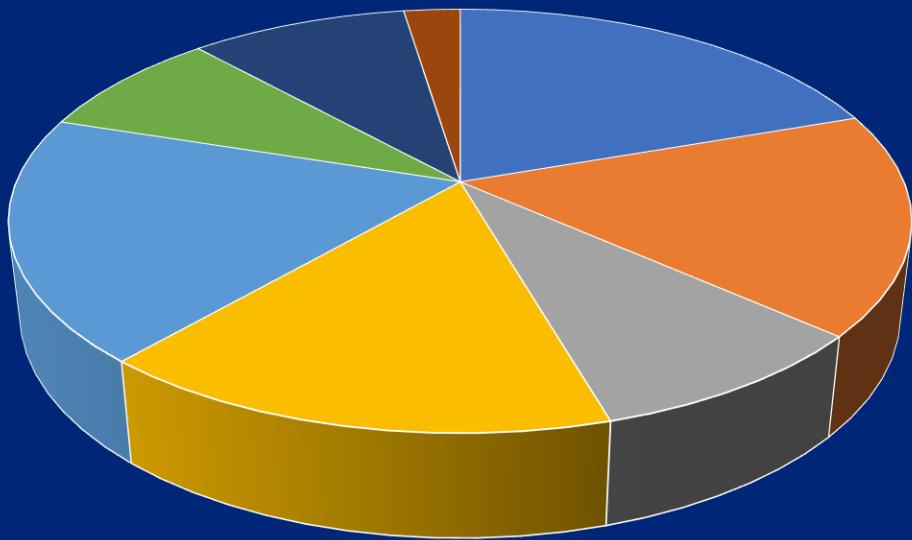
Sea Study Centre

AFFILIATI PER DIPARTIMENTO



Sea Study Centre

Thematic areas



- Mezzi marini, robotica e subacquea
- Sistemi di trasporto marittimo, logistica ed economia portuale
- Infrastrutture costiere e off-shore
- Biologia, ecologia e biotecnologie marine
- Ambiente marino e coste
- Risorse energetiche dal mare
- Turismo e crociera
- Sport del mare e attività motoria ludico-ricreativa in ambiente marino

Sea Study Centre Advisory Board

Marco Doria (President)

Nicola Bazzurro (IRETI)

Gunnar Brink (ROSEN Group)

Pierangelo Campodonico (Mu.Ma)

Giovanni Caprino (CETENA)

Laura Castellano (Acquario di Genova-Costa Edutainment S.p.A.)

Gabriele Paolo Lanza (Snam)

Eugenio Massolo (Fondazione Accademia Marina Mercantile)

Massimiliano Nannini (Istituto Idrografico della Marina)

Gabriele Nardone (ISPRA)

Monica Nolo (Associazione Manager Italia)

Francesco Siccardi (Studio Legale Siccardi Bregante)

Luigi Sinapi (International Hydrographic Organization)

Sea Study Centre

Working organization:

monthly meetings of CTS

Participation in public events for the promotion of the bachelor and master programs on sea topics

Meetings aimed at creating research networks with various types of stakeholders

Internationalization activities to promote international projects

Establishment of working groups

PhD management

The Sea Study Centre meets the Advisory Board

27-6-2023 Ocean Village - Genova



UniGe |



Suggestions by the Advisory Board

The Advisory Board at its first meeting was asked to suggest possible actions to improve the visibility of CdM and the interaction with third parties, in particular (but not only) those directly represented by the members of the AB

First suggestions

United Nations Decade of Ocean Science for Sustainable Development (2021-2030)

<https://oceandecade.org/>

- The Sea Study Centre could apply to be recognised as an **Action of the UN Ocean Decade** in the Education & Research sector, in consideration of its activities.

(Proposal by Adm. Luigi Sinapi)

DITTO (Digital Twins of The Ocean)

- The Ses Study Centre could act in several ways for the technical development of the concept (Working Group?)

(*Proposal by Adm.
Luigi Sinapi*)



3rd IHO ASSEMBLY
2-5 MAY 2023 MONACO

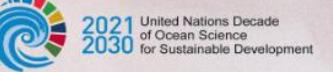
Digital Twins of the Ocean Opportunities to future-proof sustainable development

Prof. Dr. Martin Visbeck
GEOMAR Helmholtz Centre for Ocean Research Kiel and Kiel University, Germany

GEOMAR

 IHO International Hydrographic Organization

 DITTO Digital Twins of the Ocean

 United Nations Decade of Ocean Science for Sustainable Development 2021-2030

Artificial Intelligence for knowledge and protection of the marine environment

- **Combined use of AI and Robotics to**
 - **know un-explored portion of seas and oceans**
 - Identification of new species
 - Location of natural resources
 - **Data collection on environmental parameters (temperature, PH, currents,...) to improve ocean models**
 - Management of fishing activities and fish stocks
 - Strategies for plastic reduction in the sea and in general for the protection of the marine environment

(Proposal by Dott. Monica Nolo)

Large floating structures

- Safe, eco-sustainable **floating cities**, self-sufficient from the energy and food viewpoints

Example: Japanese project Dogen City, (floating city that in 2030 should host 40 000 people, with houses, schools, parks, hospital, farms, research centers.

- Use of ocean surface (70% of the planet)
- Possible application of the concept In the Ligurian region (economic and technological/scientific outcome)

(Proposal by Dott. Monica Nolo)

Maldives

- **Contacts undergoing with Maldives on**
- **Hydrography**
- **Low emission vessels (H_2)**
- **H_2 production**

Grand-Luino project

- **Luino, town with abt. 15000 inhabitants located on the North-East coast of Lake Maggiore is presently object of a large urbanistic renewal project involving**
 - **Urbanistics / architecture**
 - **Port lay-out re-definition**
 - **Inland water (channel) navigation**
 - **Environmentally friendly lake ferry boats transportation**

<https://www.weinvest.international/progetti/grand-luino>

Underwater communication infrastructures

- **TIM- SPARKLE (company active in the field of lay-down of underwater communication cables, presently involved in the Genoa area) is seeking support for the establishment of a Master in underwater communication infrastructures.**
- **At the moment a MoU with UNIGE-CdM is under consideration**

Università di **Genova**

Università della **Liguria**

Università del **Mare**

**Il dottorato di ricerca in
Scienze e Tecnologie del Mare**

Prof. Claudio Ferrari

Università di Genova

1. Unica università pubblica della Liguria
2. Prima università in Italia per formazione e ricerca legata al mare
3. Prima regione in Italia sull'Economia del mare

Centro del Mare:

1. Oltre 400 ricercatori (PhD, assegnisti, docenti)
2. Oltre 200 insegnamenti
3. 5 corsi di laurea triennale
4. 8 corsi di laurea magistrale
5. Numerosi master di primo e secondo livello
6. **PhD in Scienze e Tecnologie del Mare**
7. Partecipa a tutte le principali reti e cluster nazionali
8. Innumerevoli collaborazioni con enti pubblici e privati nazionali ed internazionali

La regione Liguria:

1. Prima per incidenza delle imprese dell'Economia del Mare
2. Prima per concentrazione di imprese della cantieristica
3. Prima per container movimentati
4. Prima per numero di unità da diporto iscritte presso gli uffici marittimi
5. Prima per numero di posti barca
6. Prima per numero di crocieristi
7. Prima per numero di bandiere blu
8. Seconda per km di coste protette

Dottorato di Ricerca



Il più avanzato ciclo di studi (3 anni, si accede con laurea magistrale, superando un concorso pubblico per titoli ed esami)



Ha la finalità di preparare alla ricerca scientifica attraverso la ricerca stessa sia per intraprendere la carriera accademica sia per svolgere attività di ricerca nelle aziende e centri di ricerca pubblici e privati



Prevede la possibilità di svolgere un periodo all'estero (per il quale la borsa di studio è incrementata del 50%)



Si conclude con la discussione pubblica di una tesi contenente i risultati delle ricerche effettuate nel triennio

Dottorato in Scienze e Tecnologie del Mare

Curriculum

1. Trasporti e Logistica
2. Scienze dell'ecosistema marino
3. Design navale e nautico
4. Macchine e sistemi energetici per il mare
5. Engineering for marine and coastal environments
6. Ingegneria navale e nautica – tecnologie marine

XXXV	Ciclo (Novembre 2019)	27 posti
XXXVI	Ciclo (Novembre 2020):	15 posti
XXXVII	Ciclo (Novembre 2021):	19 posti
XXXVIII	Ciclo (Novembre 2022):	22 posti
XXXIX	Ciclo (Novembre 2023):	27 posti

Collegio dei Docenti

- 61 professori e ricercatori UniGe
- 22 professori e ricercatori stranieri (Belgio, Brasile, Cile, Cina, Francia, Germania, Giappone, Grecia, Israele, Singapore, Svizzera, UK, USA)

Ambiti di ricerca

Architettura e
Tecnologie
navali

Layout &
Materiali

Impianti

Normative

Sistemi velici

Carene

Ambiente
marino e
costiero

Dinamica del
moto ondoso

Ciclo di vita
della nave

Degrado dei
materiali

Analisi di
mercato

Nuovi
propellenti

Motori

Sedimenti

Impatti
socioeconomici
dell'industria

Analisi
strutturali

Logistica

Diagnostica

Energie
rinnovabili

Modelli di
previsione

Collaborazioni con centri di ricerca e altri atenei



Consiglio
Nazionale delle
Ricerche



THE
MARINE
BIOLOGICAL
ASSOCIATION



NATIONAL FUEL CELL
RESEARCH CENTER
UNIVERSITY OF CALIFORNIA • IRVINE



United Nations
Educational, Scientific and
Cultural Organization



UNESCO Chair in
Engineering for Human and
Sustainable Development



UNIVERSITY OF TRENTO - Italy



CNR
Consiglio Nazionale
delle Ricerche
ISMAR
Istituto di Scienze
Marine

PONTIFICIA
UNIVERSIDAD
CATÓLICA
DE CHILE

U
Universitetet
i Stavanger



The University of
Nottingham

ESITC
CAEN

Ecole Supérieure d'Ingénieurs
des Travaux de la Construction



ROMA
TRE
UNIVERSITÀ DEGLI STUDI

TEL AVIV UNIVERSITY



University
of Antwerp

Collaborazioni con imprese, enti e istituzioni



COMUNE DI GENOVA



UniGe



Forme di collaborazione tra Università e Imprese

Università e Imprese

- Partecipazione alle Consulte dei Consigli di Corso di Studio
- Attivazione di stage e tirocini (curriculari e non curriculari)
- Finanziamento di borse di studio, premi di laurea, borse di ricerca
- Finanziamento di assegni di ricerca, dottorati o RTD
- Accordi quadro e convenzioni per la definizione di linee di ricerca di comune interesse e per l'attivazione di corsi di perfezionamento
- Partecipazione ai career day dell'Ateneo e dei singoli Dipartimenti/Scuole
- Attivazione e sviluppo di laboratori comuni
- Collaborazione nell'ambito dei dottorati industriali

Possibilità di fruizione di **credito di imposta** per investimenti in ricerca e sviluppo



**Università
di Genova**



Università
di Genova

Centro del
Mare

Gruppo di Lavoro sulla Subacquea

Giovanni Indiveri

Member of Centro del Mare

*ISME Director,
DIBRIS, University of Genova*

27 giugno 2023



Università
di Genova



Università
di Genova

Centro del
Mare



*Giovanni Indiveri, Ph. D.
ISME Director*

*Associate Professor in Systems and Control Engineering,
University of Genova, Department of Informatics,
Bioengineering, Robotics, and Systems Engineering -
DIBRIS,
Via all'Opera Pia, 13 16145 Genova, Italy.*



**Università
di Genova**

Centro del
Mare

UNIGE ha consolidate esperienze nel settore della subacquea in diversi ambiti, ad esempio:

Subacquea Scientifica per il monitoraggio ambientale (reti trofiche, modelli, raccolta dati, supporto all'acquacoltura e al restauro ambientale),

Tecnologie Subacquee (idrodinamica numerica e manovrabilità, progettazione idrodinamica di mezzi sommergibili, progettazione eliche, sistemi elettronici, protezione delle comunicazioni, sistemi di propulsione elettrica silenziosa, gestione di batterie e fuel cell in veicoli subacquei, acustica subacquea, sistemi sonar, rumore acustico subacqueo),

Ecologia, Zoologia, Paleontologia marine (fotografia subacquea, raccolta dati, modellistica, etc.),

Robotica Marina Autonoma Subacquea e di Superficie (modellistica, navigazione, guida, controllo e pianificazione di missione per robot marini autonomi. Identificazione di robot marini. Filtraggio e stima per sistemi marini. Sistemi embedded e programmazione sw per sistemi robotici.)

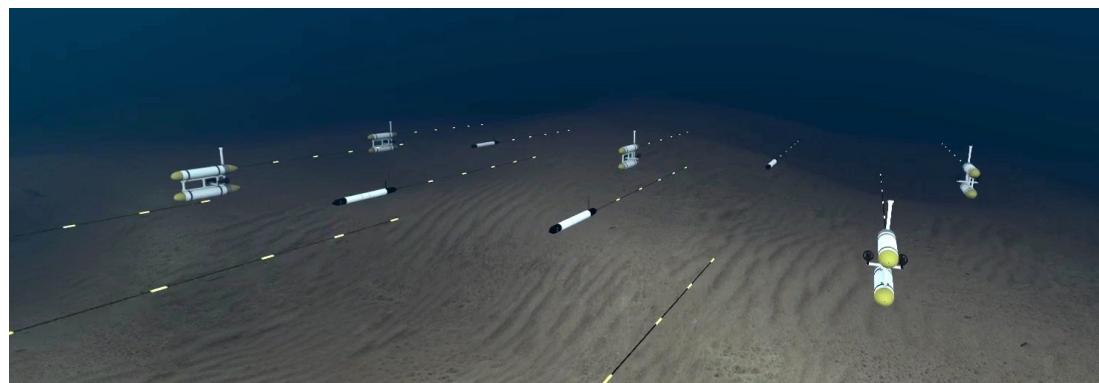


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Materiali per applicazioni subacquee (interazioni con ambiente salino, prove tecniche e di laboratorio su materiali e dispositivi),

Fotogrammetria subacquea (ricostruzione 3D, elaborazione e integrazione di dati da single o multibeam, ricostruzione batimetrica da "ocean color remote sensing" tramite analisi radiometrica di immagini telerilevate (da drone, aereo o satellite));



Prof. Stefano Schiaparelli, DISTAV UNIGE



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di Genova

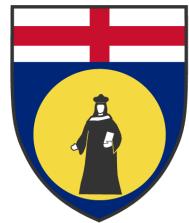
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Mare

Gruppo di Lavoro sulla
subacquea del CdM:

- Andrea Trucco (DITEN)
- Giovanni Indiveri (DIBRIS)
- Ivan Zignego (DAD)
- Enrico Rizzato (DITEN)
- Bianca Federici (DICCA)
- Stefano Schiaparelli
(DISTAV)

Potenzialità UNIGE – CdM in ambito subacqueo
includono sul breve/medio termine:

- Formazione orientata (anche) al mondo industrial (vd problema certificazioni...)
- Ricerca di base (basso TRL)
- Ricerca applicata di tipo R&D (medio TRL)
- Affiancamento alle imprese per ricerca applicata congiunta ad alto TRL



GENOVA
Legal Headquarter



PISA



FIRENZE



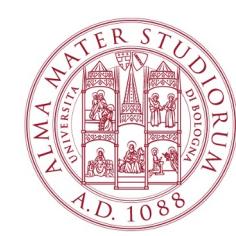
ANCONA



CASSINO



LECCE



BOLOGNA



ROMA 1



COSENZA

**NATIONAL INTER-UNIVERSITY CENTER TO SUPPORT RESEARCH ACTIVITIES IN
THE FIELDS OF MARINE TECHNOLOGIES AND OCEANIC ENGINEERING**



ISME

Integrated Systems for Marine Environment

Brief Presentation - 1

- Main background

Systems and Control Engineering

Applied Mechanics

Computer Science

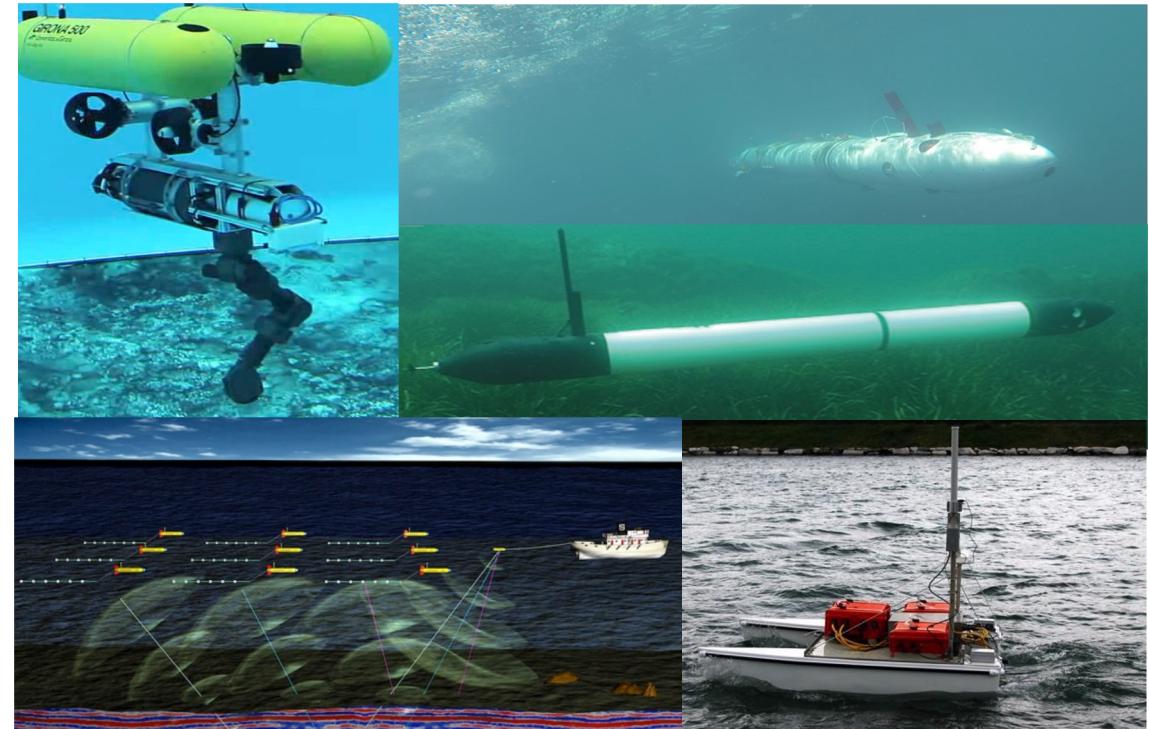
Competences and applications include

- Navigation, Guidance and Control for autonomous marine robots
- Underwater Manipulation and Intervention robotics
- Communication systems
- Marine Acoustics for communication and perception including active and passive sonars
- Acoustic Imaging
- Underwater systems mechanical design
- Networking and underwater IoT for underwater environment monitoring and surveillance
- AI and Machine Learning methods
- System identification methods for marine systems
- Proprioceptive and exteroceptive perception
- Mission planning and execution + Human-Machine Interface
- Cooperative Robotics

Brief Presentation - 1

Established in 1999

- 9 Italian University members
- 35- Structured researchers; 15-20 young researchers
- Shared Infrastructures, labs, equipments
- Funding from EU, National , Industrial res. projects
- 1MEuro/year (approximate average of last 5 years)
- CSSN-ISME Joint Lab (SEALab)



A national academic collaborative network of wide-spectrum synergic competences, devoted to research and development on marine unmanned system.

Projects Logos



DexROV



VENUS
Virtual Exploration of Underwater Sites



SUONO

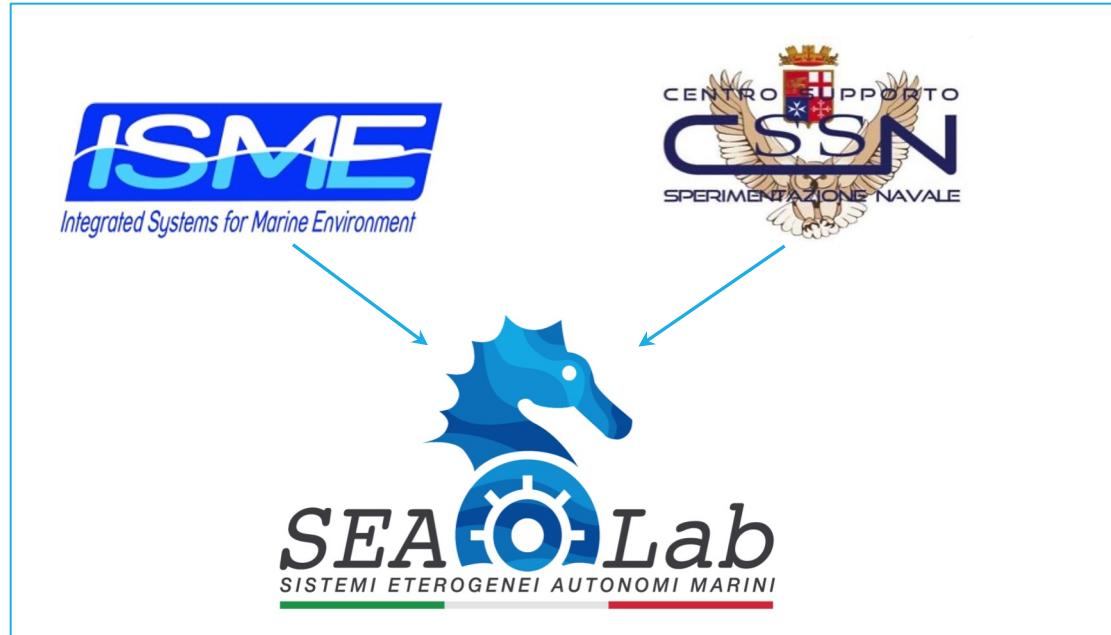


ARROWS
ARCHAEOLOGICAL ROBOT SYSTEMS FOR THE WORLD'S SEAS

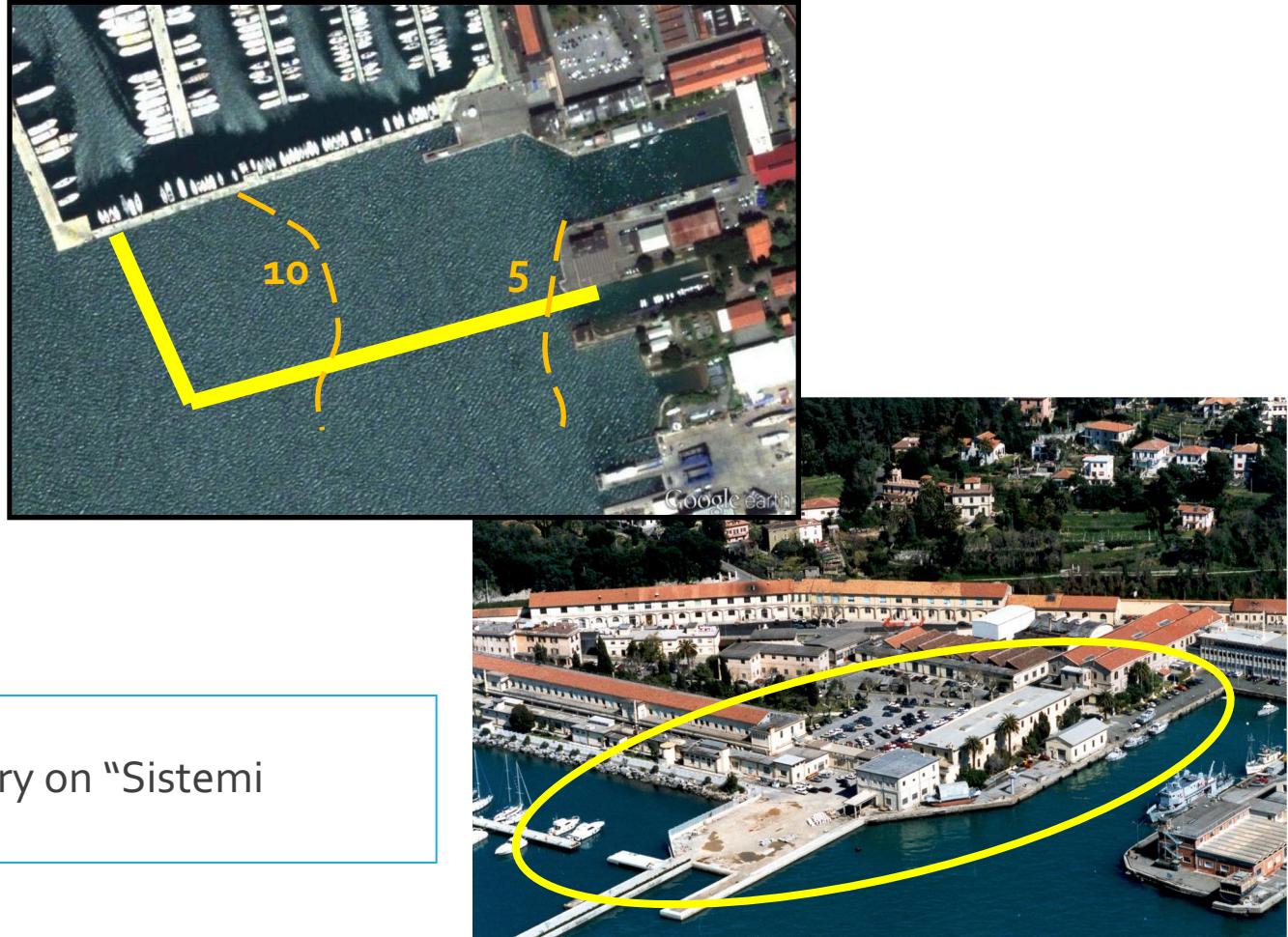


ARCHEOSUB.EU

Brief Presentation - 2



(started in 2015) SEALab: Joint CSSN-ISME Laboratory on "Sistemi Eterogenei Autonomi"





Integrated Systems for Marine Environment



Integrated Systems for Marine Environment



This site of Marina Militare Italiana is chosen to host the new “Polo Nazionale della Subacquea” from 2023

Polo Nazionale Subacquea





Livorno,
27 marzo 2023



La Spezia,
6 giugno 2023



Università
di Genova

Centro del
Mare

Interreg



Cofinanziato
dall'Unione europea
Cofinancé par
l'Union européenne

Marittimo-IT FR-Maritime

ID del progetto (creato automaticamente)	IF Marittimo00042
Nome organizzazione del capofila	Università degli Studi di Genova, DIBRIS
Nome organizzazione del capofila (in lingua inglese)	University of Genova, DIBRIS
Titolo progetto	Filiera dell'Industria e della Ricerca Subacquea Transfrontaliera
Acronimo progetto	FIRST
Priorità del programma	Un'area transfrontaliera attrattiva, improntata alla modernizzazione intelligente e sostenibile
Obiettivo specifico della priorità	RSO1.4: Sviluppare le competenze per la specializzazione intelligente, la transizione industriale e l'imprenditorialità
Durata del progetto (mesi)	36

Nome organizzazione in inglese	Paese (NUTS 0)
University of Genova, DIBRIS	Italia (IT)
University of Toulon	France (FR)
Liguria Region	Italia (IT)
Municipality of La Spezia	Italia (IT)
Pôle Mer Méditerranée	France (FR)
University of Pisa	Italia (IT)
ITS Foundation "Mo.So.S" - Sustainable mobility Sardinia	Italia (IT)
NAVIGO SCARL	Italia (IT)



**Università
di Genova**

**Centro del
Mare**

Interreg



Cofinanziato
dell'Unione europea
Co-financé par
l'Union européenne

Marittimo-IT FR-Maritime

CALENDARIO AVVISI 2021-2027

PER L'AREA DI COOPERAZIONE DEL PROGRAMMA

AVVISI	PRIORITÀ	BUDGET	APERTURA	CHIUSURA
I Avviso	1, 2, 3, 4, 5 (ISO 6.1, ISO 6.2)	77,2 M	Febbraio 2023	Maggio 2023
II Avviso	2, 5 (ISO 6.3)	16,6 M	Settembre 2023	Inizio 2024
III Avviso	1, 2, 3, 4, 5	73,2 M	I semestre 2024	I semestre 2024
IV Avviso	2, 3	13,6 M	II semestre 2026	II semestre 2026

La cooperazione al cuore del Mediterraneo



La coopération au cœur de la Méditerranée

Interreg



Cofinanziato
dell'Unione europea
Co-financé par
l'Union européenne

Marittimo-IT FR-Maritime



A deep blue underwater photograph showing a school of small fish swimming over a rocky seabed. Sunlight filters down from the surface in bright rays.

Thank you !

Aquaculture Working Group

Composition:

around **30** researchers

6 Departments: DISTAV, DICCA, DISFOR, DIFAR,
DITEN, DISSAL

Topics:

Fish and shellfish welfare

Food health

Microalgae as fish food

Microbial and fungal pathogens

Shelf life of feed and fish

Active biomolecules characterization

Sustainable feed

Circular feed

Functional feeds in aquaculture

Valorization of fish wastes

Reduction of environmental impact of fish wastes

Spatial planning, allocated zones for aquaculture

IMTA

Invertebrates reproduction

Aquaculture for restocking and restoration purposes

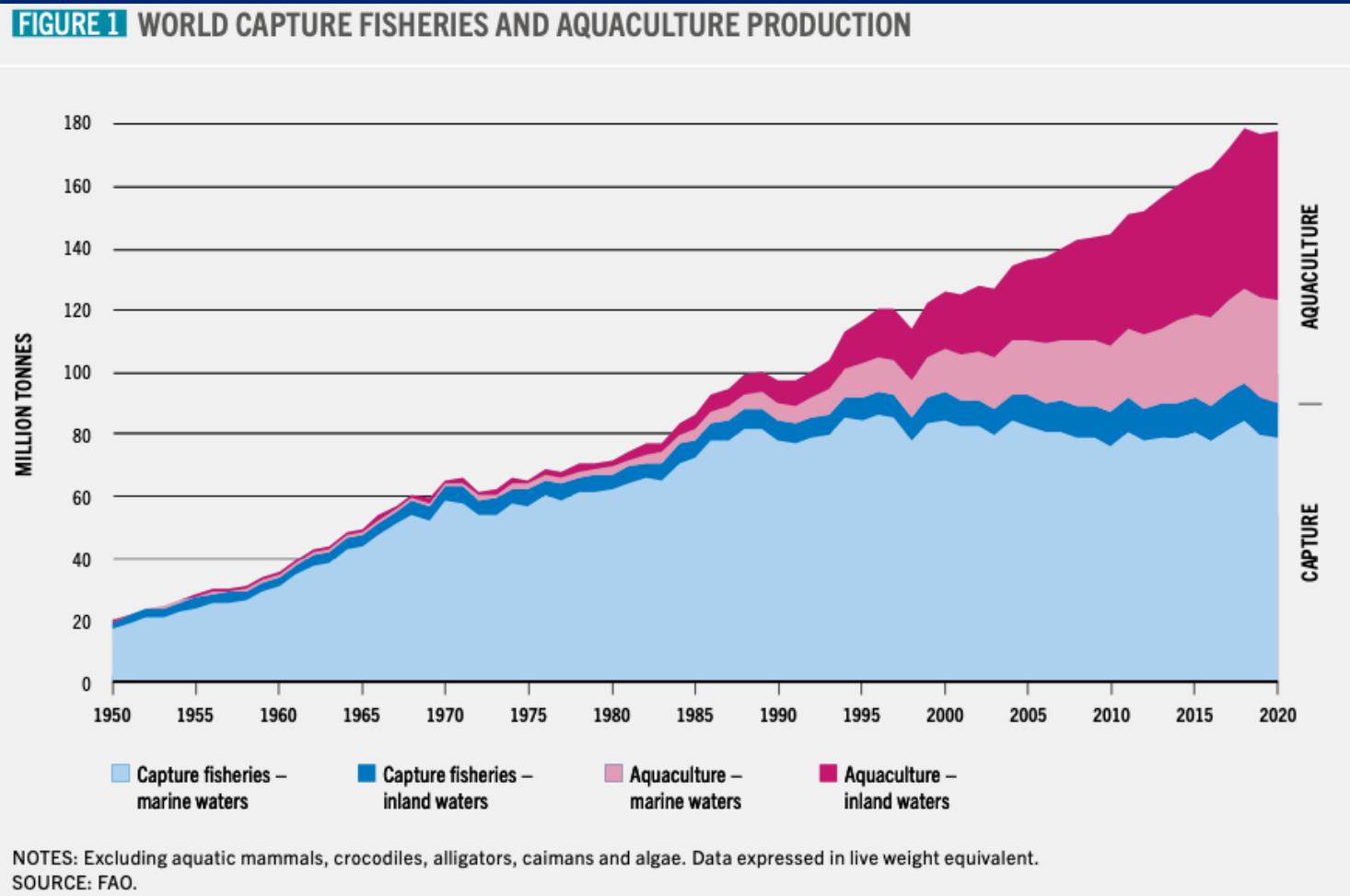
Fish cage design

Cage corrosion, cage fouling, anti fouling coatings

Ethical issues related to aquaculture and animal welfare

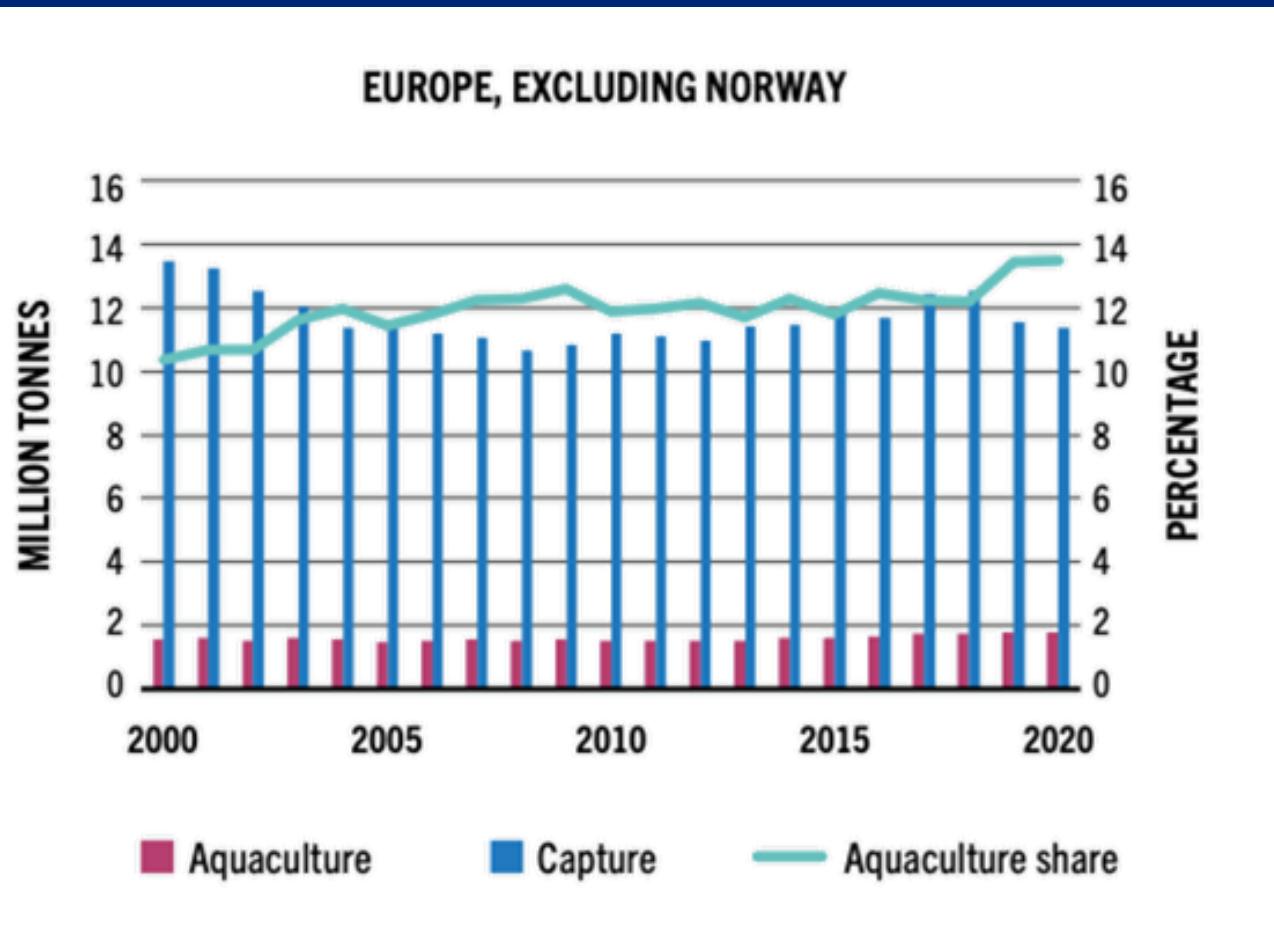


Referent: Mariachiara Chiantore - DISTAV
mariachiara.chiantore@unige.it

FIGURE 1 WORLD CAPTURE FISHERIES AND AQUACULTURE PRODUCTION

In crescita su scala globale con tasso di circa 8% annuo negli ultimi 30 anni

Attualmente fornisce circa il 50% del prodotto ittico globale per il consumo umano



EU

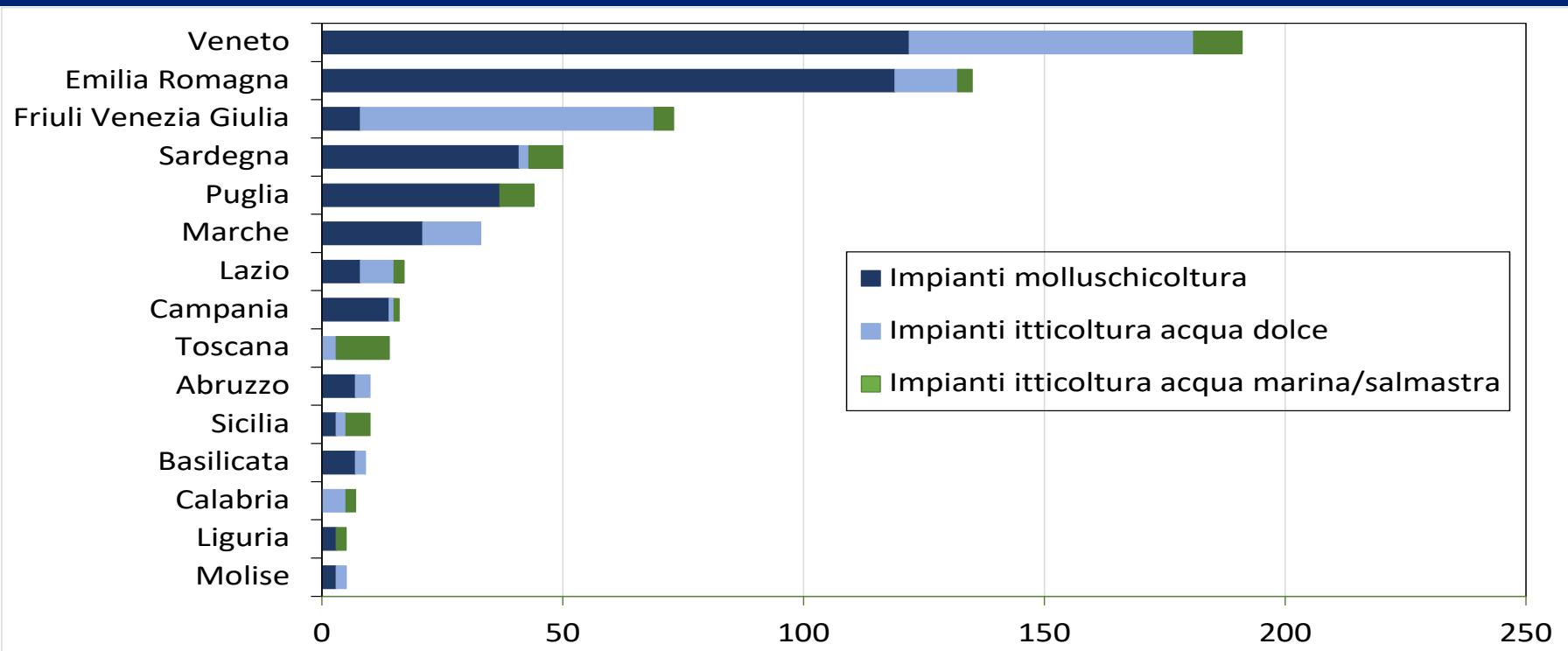
In Europa (Norvegia esclusa), non si osserva un incremento negli ultimi 20 anni

Stagnazione del settore

386 impianti di
molluschicoltura

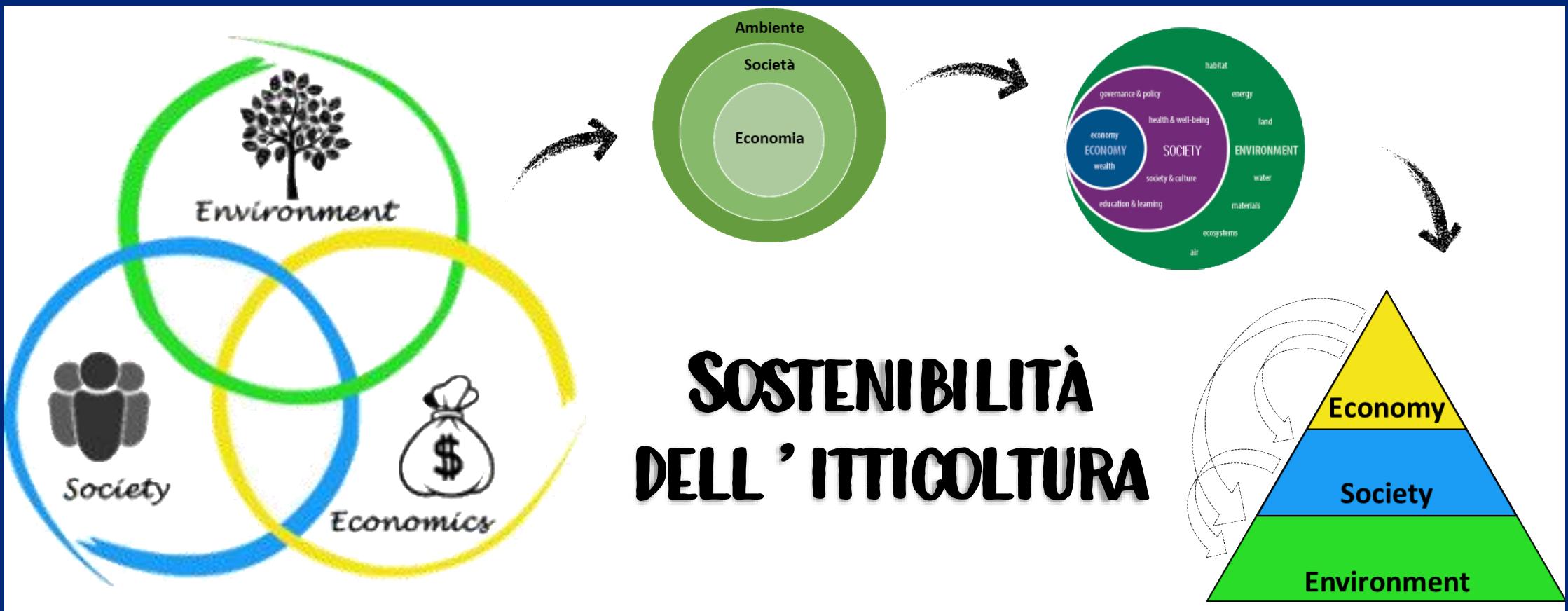
250 impianti
piscicoltura d'acqua
dolce

54 impianti
piscicoltura d'acqua
marina/salmastra



ITALIA

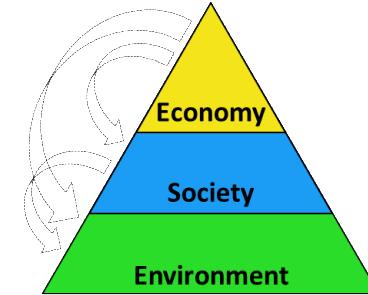
Sostenibilità dell'acquacoltura



Sostenibilità dell'acquacoltura



Massimizzare
la crescita dei pesci e
minimizzare lo
stress ambientale



**SITO
IDONEO**

Minimizzare i conflitti
con altri utenti

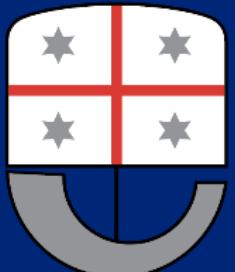
Minimizzare i costi di
gestione e produzione

ATLANTE DEL MARE

**"Studi per l'individuazione di nuove aree per
l'acquacoltura offshore"**

Reg. UE 508/2014/FEAMP Art. 51, Priorità 4-Sviluppo locale di tipo partecipativo

COORDINAMENTO PROGETTO



**REGIONE
LIGURIA**

RESPONSABILE SCIENTIFICO



**Università
di Genova**

PARTNER ISTITUZIONALI



Modalità di attuazione

4 sotto-progetti:

1. Monitoraggio delle tecnologie
2. Mappatura dell'area FLAG GAC Savonese
3. Studio per l'individuazione di nuove aree per l'acquacoltura *offshore*
4. Sensibilizzazione

UniGe

DISTAV

UniGe

DICCA

UniGe

DISFOR

ASSEGNAZIONE DI ZONE MARINE
PER L'ACQUACOLTURA (AZA)
- GUIDA TECNICA -

Ocean & Coastal Management 116 (2015) 64–77

Contents lists available at ScienceDirect
 Ocean & Coastal Management
journal homepage: www.elsevier.com/locate/ocecoaman

A spatial multi-criteria evaluation for site selection of offshore marine fish farm in the Ligurian Sea, Italy

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Mariachiara Chiantore ^a, Bianca Fedenici ^a, Paolo Povero ^a

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ARTICLE INFO

Article history:
Received 20 January 2015
Received in revised form
28 May 2015
Accepted 29 June 2015
Available online 17 July 2015

Keywords: Spatial multi-criteria evaluation
GIS
Marine spatial planning
Fish farming
Suitable site selection
Allocated zone for aquaculture

ABSTRACT

Mariculture is a relatively new activity that is expanding globally and interacts with other coastal uses. Therefore, it is necessary to allocate suitable sites from environmental, economic and social points of view, involving different stakeholders in the decision-making process. In particular, in the Ligurian Sea (Italy), for its specific characteristics, traditional farmers should be further boosted and an appropriate spatial plan should be done. This paper presents a spatial multi-criteria evaluation (SMCE) addressed to identify suitable areas for setting offshore medium size fish farms in the Ligurian Sea at the regional scale. The SMCE procedure follows an integrated approach that can be potentially adapted and applied to any coastal system. The site selection is based on the definition of criteria used to assess their suitability, which are grouped in three categories: environmental, socio-economic and labor. A scale from 1 (suitable) to 10 (optimal). More than 9000 ha were identified and almost 40% of this area gets high suitability values, from 7 to 9, pointing out the unexploited potential for Ligurian marine coastal zones. Results demonstrate that our SMCE, and in particular its procedure, allows identifying the most suitable suitable areas in an easy and quick way and solving effectively the complex spatial problem of suitable site selection for fish farming.

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1. Introduction

Mariculture has undergone a rapid expansion around the world in order to cope with growing protein demand of increasing world population. Its development leads to an increase of environmental concerns and questions about possible ecological impacts and growing risk of competition between fish farmers and multiple users of coastal space and marine environment (Ferenc et al., 2005).

Specifically, in the Liguria and the Mediterranean coasts have shown significantly recent years. In 2010 in Italy, 126 farms of marine species were recorded, 54 of which were operating using floating cages. In 2008 (the most recent data available) marine fish Italian production from mariculture has reached almost 29 thousand tons, 9600 tons sea bream, 9800 sea bass, 3500 mullet and the remaining shrimps, white sea bream and bluefin tuna. Shellfish production accounted for 165 thousand tons, 115 mussels and 50 clams (ISMAR, 2010).

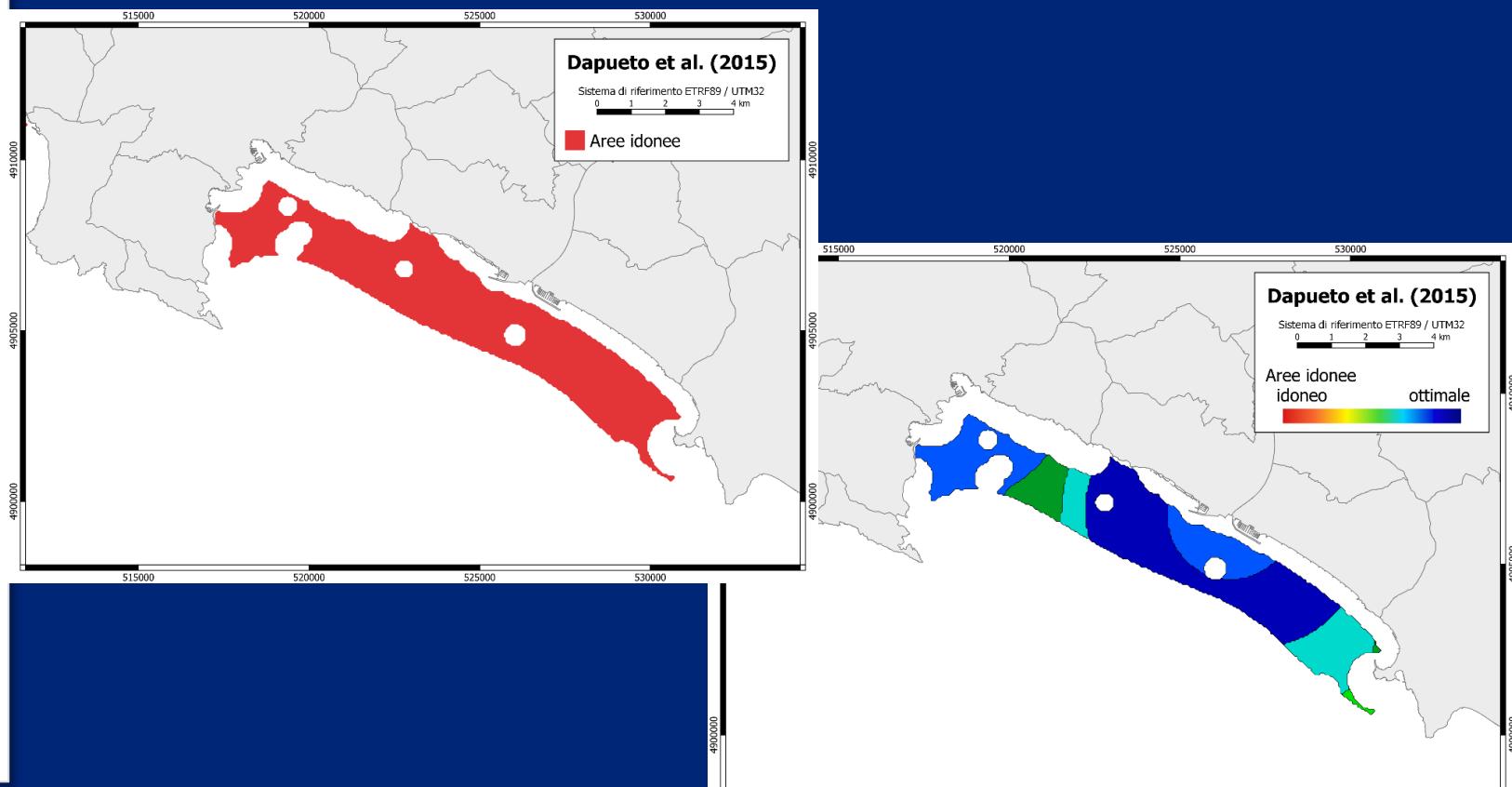
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<http://dx.doi.org/10.1016/j.ocecoaman.2015.06.030>
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 Centro del
Mare

Aquaculture Working Group

Procedura integrata per
IDENTIFICARE E CLASSIFICARE LE AREE IDONEE
per l'itticoltura *offshore*

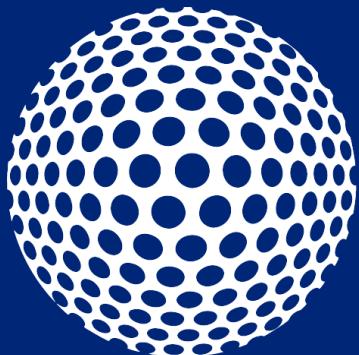


Aquaculture Working Group

La mangimistica

Il riciclo

Le applicazioni biotecnologiche



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ACTIVITY 3: Valorization of marine resources



*Action 3.1
Circular feed for
carbon neutrality*



*Action 3.2
Marine multitrophic
aquaculture*



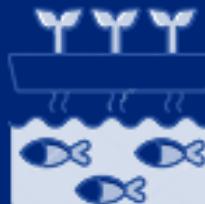
*Action 3.3
Improved fish health without
using antimicrobials*



*Action 3.5
Microbiome applications*



*Action 3.4
Selective breeding*



*Action 3.6
Biotechnological applications*

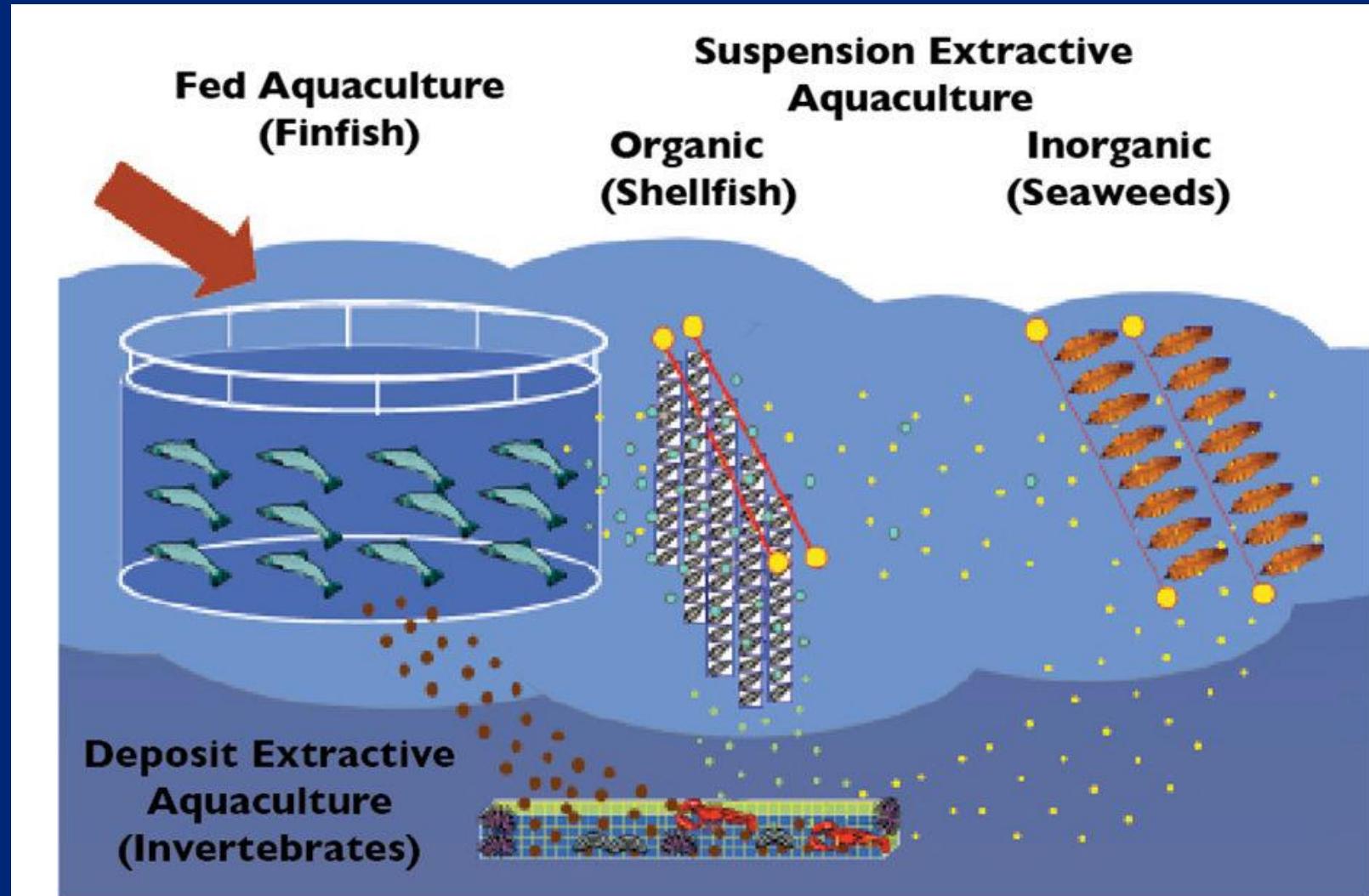
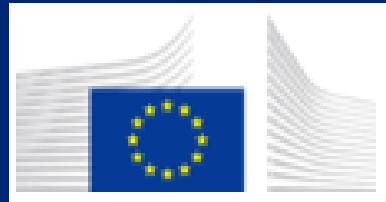
L'Acquacoltura Multitrofica Integrata



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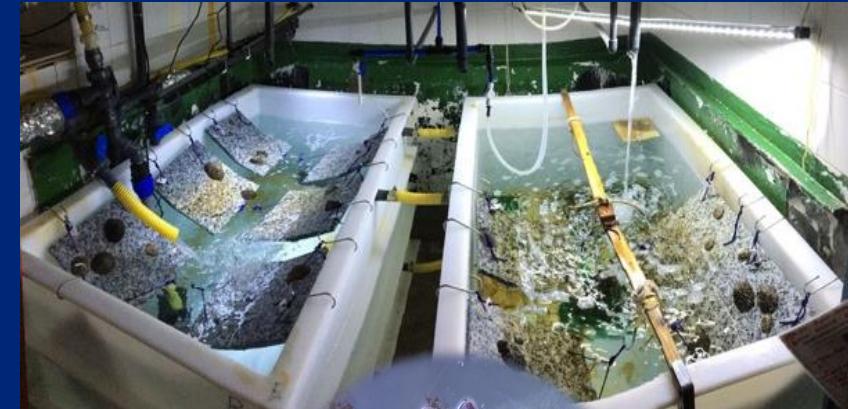
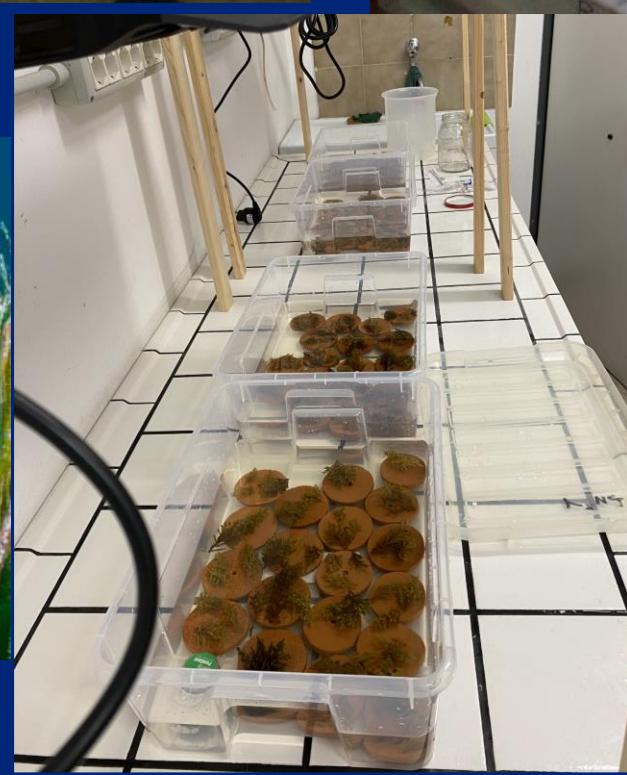
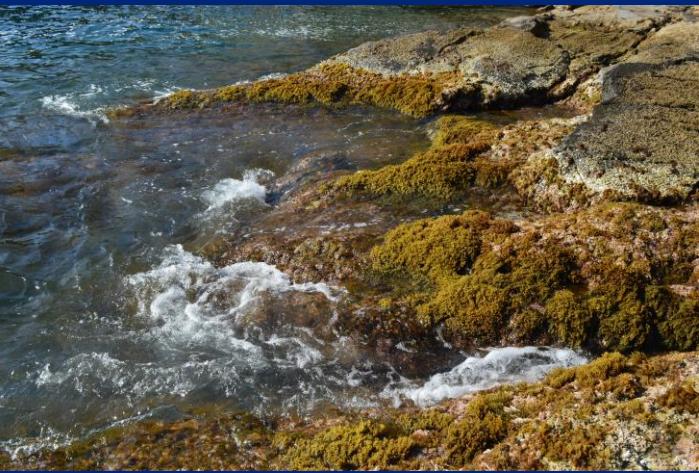
HORIZON CL6-2022-
FARM2FORK-02-two-stage



L'Acquacoltura per il restauro ecologico



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Next steps:

1. Nuova ricognizione delle expertise del *working group*
2. Ricognizione delle attività progettuali in corso
3. Organizzazione workshop