

FINAL DISSEMINATION EVENT OF THE PROJECT

Deliverable Number D.2.7.6

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INTRODUCTION

The Municipality of Ravenna, as Lead Partner of the Adrireef project, organized the final project dissemination event on the 23rd and 24th of November 2021. The meeting was the ideal occasion to present the results and to share them with the stakeholders. On the 23rd, the meeting started with the greetings of the Deputy Head of Unit, Sea basin strategies, Maritime Regional Cooperation and Maritime Security of the Directorate General MARE of the European Commission, Ms Iglia Yakova, who also presented the forthcoming European Maritime Day that will be held in Ravenna in May 2022. Then, a whole panel was dedicated to the description of the project technical evidences followed by a presentation of the ecosystem services provided by the reefs. Finally, a round table session focused on the two final documents produced by the partnership (the *Guidelines* and *code of conduct* for the development of sustainable business on the reefs and the *White paper* on the innovative development of Adriatic reefs) was the chance to discuss all the topics and think of future strategies. The event was moderated by Stefano Valentini from ART-ER, the regional development agency for the Emilia-Romagna Region coordinating blue-growth related projects for the Research and Innovation department. On the 24th, the meeting continued with a training session on the development of sustainable business enterprises on the Adriatic reefs with the analysis of different case studies and of the related funding opportunities. In addition, a photo exhibition called *A journey in the daily life of the "cozzari": the local fishermen of the wild mussel of Marina di Ravenna* was organized during the period of the final event. The event was organised at Palazzo Rasponi dalle Teste in Ravenna and it was broadcasted online via streaming too. Finally, during the meeting days, a series of site visits to local businesses and city highlights were also organised.

THE DIGITAL LEAFLET

ADRIREEF

**INNOVATIVE EXPLOITATION OF ADRIATIC REEFS
IN ORDER TO STRENGTHEN BLUE ECONOMY**

FINAL DISSEMINATION EVENT

SEMINARIO DI FORMAZIONE LOCALE

MERCOLEDÌ 24 NOVEMBRE 2021
Palazzo Rasponi dalle Teste, Piazza Kennedy 12, Ravenna

ORE 10.00

SVILUPPO ATTIVITÀ IMPRENDITORIALI SOSTENIBILI NEI REEF DELL'ADRIATICO

IMPRESE SOSTENIBILI PER I REEF DELL'ADRIATICO

SIMONE D'ACUNTO - Cooperativa Torpedo

FONDI EUROPEI E FINANZA AGEVOLATA: OPPORTUNITÀ PER LO SVILUPPO D'IMPRESA

GIANCARLO D'ANGELO - Ethic srl

**L'ACCESSO AL SEMINARIO È POSSIBILE PREVIO
ACCERTAMENTO ALL'INGRESSO DEL CERTIFICATO
GREEN PASS, NEL CORSO DEI LAVORI È OBBLIGATORIO
INDOSSARE LA MASCHERINA FACCIALE.**

INFO:

+39 0544 482659

giuliacillani@comune.ra.it

www.italy-croatia.eu/adrireef

THE EVENT AGENDA

ADRIREEF

**INNOVATIVE EXPLOITATION OF ADRIATIC REEFS
IN ORDER TO STRENGTHEN BLUE ECONOMY**

FINAL DISSEMINATION EVENT

RAVENNA, 23RD – 24TH NOVEMBER 2021

FINAL EVENT SEMINAR

TUESDAY, 23RD OF NOVEMBER 2021

Palazzo Rasponi dalle Teste, Piazza Kennedy 12, Ravenna (Italy)
(English session)

Web conference link: bit.ly/2YDAbOz

2.30 PM

INTRODUCTION

EUROPEAN MARITIME DAY 19 & 20 MAY 2022, RAVENNA, AN OVERVIEW

IGLIKA YAKOVA

Deputy Head of Unit, Sea basin strategies, Maritime Regional Cooperation and Maritime Security, DG MARE, European Commission

GIACOMO COSTANTINI

Tourism – Council Member / Municipality of Ravenna

ANNAGIULIA RANDI

European Policies, International Cooperation – Council Member / Municipality of Ravenna

3.00 PM

THE ADRIREEF PROJECT OUTLINE

THE ADRIREEF PROJECT STORYLINE – A VIDEO STORY OF THE PROJECT ACTIVITIES

ADRIREEF STAFF

THE REEFS OF THE ADRIATIC SEA: MAPPING OF NATURAL AND ARTIFICIAL REEFS AND SELECTION OF INNOVATIVE SYSTEMS FOR THEIR MONITORING

GIANNA FABI

CNR – IRBIM

MONITORING OF NATURAL AND ARTIFICIAL REEFS IN ITALY AND CROATIA DURING ADRIREEF PROJECT

SILVIA FIGOZZI

ARPAE – Emilia-Romagna Regional Agency for Prevention, Environment and Energy

MONITORING OF THE CASE STUDIES: INNOVATIVE TECHNOLOGIES AND METHODOLOGIES

- **PHOTOGRAMMETRY, 3D MAPPING & VIRTUAL REALITY**

MARCO PALMA

Ubica Srl / Municipality of Ravenna

- **NEAR REAL-TIME OCEANOGRAPHIC MONITORING AND IN-LAND DATA TRANSFER**

GIANNA FABI

CNR – IRBIM

- **VISUAL CENSUS WITH COMBINED USE OF SCIENTIFIC DIVERS AND ROV**

ENRICO BARBONE, GAETANO COSTANTINO, ILARIA DALLE MURA, MARCO D'ONGHIA, MICHELE DE GIOIA, GIUSEPPE STRIPPOLI,

NICOLA UNGARO

ARPA Puglia

- **INNOVATIVE TECHNIQUES USED IN CROATIAN CASE STUDY SITES**

LOVRE MAGLIC

University of Rijeka – Faculty of Maritime Studies

4.30 PM

COFFEE BREAK

4.45 PM
THE DISSEMINATION & DISCUSSION OF RESULTS – ROUND TABLE

Moderator: **STEFANO VALENTINI**
Divisione Ricerca e Innovazione / Art-ER

NATURAL AND ARTIFICIAL REEFS AS PROVIDERS OF (ESSENTIAL) ECOSYSTEM SERVICES

FRANCESCA VISINTIN
eFrame srl
MASSIMILIANO PINAT
CNR – IRBIM

THE ADRIREEF GUIDELINES FOR STAKEHOLDERS & THE CODE OF CONDUCT FOR REEF USERS

ZADRA NOVA
Zadar County Development Agency

INTERVENTIONS BY
● CROATIAN CHAMBER OF ECONOMY
● ITALIAN RELEVANT BODY

THE ADRIREEF WHITE PAPER OF INNOVATIVE EXPLOITATION

ZADRA NOVA
Zadar County Development Agency

INTERVENTIONS BY
● CROATIAN DIRECTORATE FOR EUROPEAN TERRITORIAL COOPERATION
● EUSAIR ITALIAN NATIONAL COORDINATION

OPEN DEBATE

6.15 PM
END OF WORKING SESSION

LOCAL TRAINING SEMINAR

WEDNESDAY, 24TH NOVEMBER 2021

Palazzo Rasponi dalle Teste, Piazza Kennedy 12, Ravenna (Italy)
(Italian session)

10.00 AM
SVILUPPO ATTIVITA' IMPRENDITORIALI SOSTENIBILI NEI REEF DELL'ADRIATICO

IMPRESE SOSTENIBILI PER I REEF DELL'ADRIATICO
SIMONE D'ACUNTO – Cooperativa Torpedo

FONDI EUROPEI E FINANZA AGEVOLATA: OPPORTUNITÀ PER LO SVILUPPO D'IMPRESA
GIANCARLO D'ANGELO – Ethic srl

EXHIBITION

23RD – 28TH OF NOVEMBER 2021

Palazzo Rasponi dalle Teste, Piazza Kennedy 12, Ravenna (Italy)
(Italian session)

LA SELVAGGIA DI MARINA DI RAVENNA

A journey in the daily life of the "cozzari": the local fishermen of the wild mussel of Marina di Ravenna.
PHOTO EXHIBITION BY FRANCO FERRETTI AND GIOVANNI SEGURINI

**ACCORDING TO ITALIAN REGULATIONS, ADRIREEF
FINAL EVENT ACTIVITIES AND ITS LOCATIONS
ARE ACCESSIBLE ONLY BY SHOWING GREEN PASS
CERTIFICATE OR OTHER EU DIGITAL COVID CERTIFICATE
ISSUED BY OWN COUNTRY AUTHORITIES**

INFO:

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www.italy-croatia.eu/adrireef

In addition to the program of the seminars, a side program with social meetings and site visits was elaborated for the reception of the project partners.

THE PRESS RELEASE

The following is the press release that was launched to promote the event:

Ravenna, 19 novembre 2021
Comunicato stampa

23 e 24 novembre: incontro finale del Progetto Europeo Adrireef

Martedì 23 e mercoledì 24 novembre, presso il salone Nobile di Palazzo Rasponi dalle Teste, è in programma l'incontro conclusivo del progetto Europeo **Adrireef, innovative exploitation of Adriatic Reefs in order to strengthen blue economy** (www.italy-croatia.eu/adrireef), finanziato dal programma Interreg Italia-Croazia.

Martedì 24 novembre, alle 14.30 aprirà i lavori Giacomo Costantini assessore al Turismo in qualità di lead partner del progetto insieme a Igljka Yakova vice-direttore DG MARE Commissione Europea.

Dopo un lavoro di monitoraggio sul campo effettuato tramite l'utilizzo di tecnologie innovative, l'obiettivo del progetto è delineare una prospettiva di sviluppo sostenibile per i reef naturali ed artificiali dell'Adriatico.

L'evento finale sarà l'occasione per presentare i risultati raggiunti e potenziare il network della comunità di operatori legati alla Blue Growth adriatica.

Il programma prevede un primo panel di approfondimento e presentazione delle evidenze tecnico/scientifiche emerse e dei servizi ecosistemici ed un secondo dedicato alla presentazione e discussione dei deliverable finali: *Guidelines & Code of Conduct* per lo sviluppo di imprese sostenibili sui reef e *White Paper* sullo sfruttamento innovativo dei reef nel mare Adriatico.

Mercoledì 24 novembre, alle 10 è in programma un incontro *sullo Sviluppo delle attività imprenditoriali sostenibili nei reef dell'Adriatico*, con gli interventi di Simone d'Acunto della Cooperativa Torpedo e Giancarlo D'Angelo di Ethic srl.

Gli incontri sono aperti a giornalisti, imprese del settore blue economy, istituti di ricerca e formazione, operatori del settore turismo/mare e al pubblico. Per accedere alla sede del convegno sarà necessario possedere Green Pass valido. Nel corso dell'evento sarà obbligatorio indossare la mascherina facciale. Per coloro che non potessero presenziare di persona, è possibile seguire i lavori in modalità webconference collegandosi al seguente link:

bit.ly/2YDAboZ

Si richiede gentilmente conferma dell'eventuale presenza a: giuliacillani@comune.ra.it
In allegato il programma dettagliato delle due giornate.

THE PRESS REVIEW

This is the press review:


CORRIERE ROMAGNA DI RAVENNA E IMOLA
Rassegna del: 21/11/21
Edizione del: 21/11/21
Estratto da pag.: 11
Foglio: 1/1

Sezione QUOTIDIANI LOCALI
Dir. Resp. Roberto Masini
Tiratura: n.d. Diffusione: n.d. Lettori: n.d.

Due giorni di incontri a Ravenna sullo sviluppo sostenibile dei reef

Martedì prossimo alle 14.30 aprirà i lavori **Giacomo Costantini** assessore al Turismo

RAVENNA
Martedì 23 e mercoledì 24 novembre nel salone nobile di palazzo Rasponi dalle Teste è in programma l'incontro conclusivo del progetto europeo Adrireef, innovative exploitation of adriatic reefs in order to strengthen blue economy, che intende incrementare la crescita blu attraverso lo studio di misure innovative sui reef adriatici (www.italy-croatia.eu/adrireef), finanziato dal programma Interreg Italia-Croazia.

Martedì 23 novembre alle 14.30 aprirà i lavori **Giacomo Costantini**, assessore al Turismo, in qualità di lead partner del progetto insieme a Igljka Yakova, vice-direttore della direzione generale per gli affari marittimi e la pesca della Commissione europea.

Dopo un lavoro di monitoraggio sul campo effettuato tramite l'utilizzo di tecnologie innovative, l'obiettivo del progetto è delineare una prospettiva di sviluppo sostenibile per i reef naturali ed artificiali dell'Adriatico. L'evento finale sarà l'occasione per presentare i risultati raggiunti e potenziare il network della comunità di operatori legati alla crescita blu adriatica.

Il programma prevede un primo panel di approfondimento e presentazione delle evidenze tecnico/scientifiche emerse e dei servizi ecosistemici ed un secondo dedicato alla presentazione e discussione dei risultati attesi finali: Guidelines & Code of Conduct per lo sviluppo di imprese sostenibili sui reef e White Paper sullo sfruttamento innovativo dei reef nel mare Adriatico.

Mercoledì 24 novembre alle 10 è in programma un incontro sullo "Sviluppo delle attività imprenditoriali sostenibili nei reef dell'Adriatico", con gli interventi di Simone d'Accunto della cooperativa Torpedo e Giancarlo D'Angelo di Ethic srl.

Gli incontri sono aperti a giornalisti, imprese del settore blue economy, istituti di ricerca e formazione, operatori del settore turismo/mare e al pubblico. Per accedere alla sede del convegno sarà necessario possedere Green Pass valido. Nel corso dell'evento sarà obbligatorio indossare la mascherina. Per coloro che non potessero presenziare di persona, è possibile seguire i lavori in modalità webconferenze collegandosi al seguente link: bit.ly/2YDAbOz


CORRIERE ROMAGNA DI RAVENNA E IMOLA
Rassegna del: 23/11/21
Edizione del: 23/11/21
Estratto da pag.: 14
Foglio: 1/1

Sezione QUOTIDIANI LOCALI
Dir. Resp. Roberto Masini
Tiratura: n.d. Diffusione: n.d. Lettori: n.d.

Due giorni di incontri al via a Ravenna sulla "blue economy"

RAVENNA
Oggi e domani al salone nobile di palazzo Rasponi dalle Teste è in programma l'incontro conclusivo del progetto europeo Adrireef, innovative exploitation of adriatic reefs in order to strengthen blue economy, che intende incrementare la crescita blu attraverso lo studio di misure innovative sui reef adriatici, finanziato dal programma Interreg Italia-Croazia. Ad aprire i lavori oggi alle 14.30 sarà Giacomo Costantini, assessore al turismo, in qualità di lead partner del progetto insieme a Igljka Yakova, vice-direttore della direzione generale per gli affari marittimi e la pesca della Commissione europea. Dopo un lavoro di monitoraggio sul campo effettuato tramite l'utilizzo di tecnologie innovative, l'obiettivo del progetto è delineare una prospettiva di sviluppo sostenibile per i reef naturali ed artificiali dell'Adriatico. L'evento finale sarà l'occasione per presentare i risultati raggiunti e potenziare il network della comunità di operatori legati alla crescita blu adriatica. Domani invece alle 10 è in programma un incontro sullo "Sviluppo delle attività imprenditoriali sostenibili nei reef dell'Adriatico", con gli interventi di Simone d'Accunto della cooperativa Torpedo e Giancarlo D'Angelo di Ethic srl.

Ravennanotizie.it

Il 23 e il 24 novembre a Ravenna l'incontro finale sullo studio di misure innovative sui reef adriatici

Lunedì 22 Novembre 2021

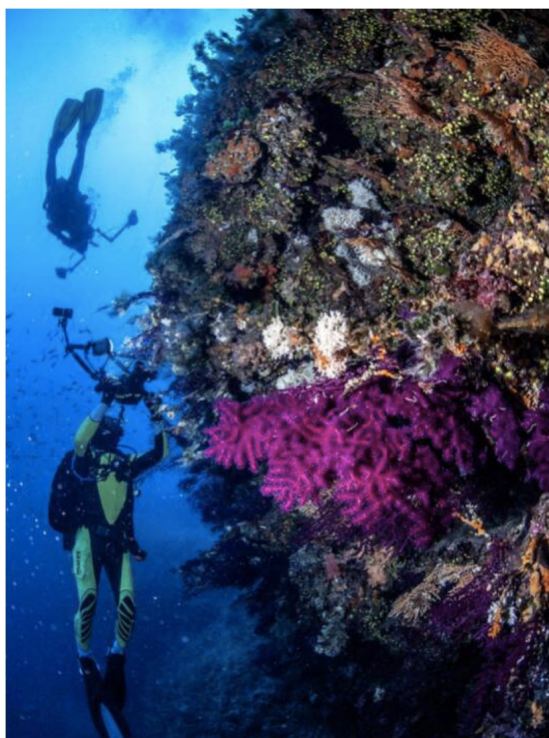


Martedì 23 e mercoledì 24 novembre nel salone nobile di palazzo Rasponi dalle Teste, a Ravenna, è in programma l'incontro conclusivo del progetto europeo **Adrireef, innovative exploitation of adriatic reefs in order to strengthen blue economy** (qui il programma), che intende incrementare la crescita blu attraverso lo studio di misure innovative sui reef adriatici (www.italy-croatia.eu/adrireef), finanziato dal programma Interreg Italia-Croazia.

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Mercoledì 24 novembre alle 10 è in programma un incontro sullo “Sviluppo delle attività imprenditoriali sostenibili nei reef dell’Adriatico”, con gli interventi di Simone d’Accunto della cooperativa Torpedo e Giancarlo D’Angelo di Ethic srl. Gli incontri sono aperti a giornalisti, imprese del settore blue economy, istituti di ricerca e formazione, operatori del settore turismo/mare e al pubblico. Per accedere alla sede del convegno sarà necessario possedere Green Pass valido. Nel corso dell’evento sarà obbligatorio indossare la mascherina. Per coloro che non potessero presenziare di persona, è possibile seguire i lavori in modalità webconference collegandosi al seguente link: bit.ly/2YDAbOz. Confermare l’eventuale presenza a: giuliacillani@comune.ra.it.



RELEVANT PAPERS

This is the list of the presentations that were discussed during the seminar:

1 – The European Maritime Day 2022 presentation

Ms. Igljka Yakova (Deputy Head of Unit, Sea basin strategies, Maritime Regional Cooperation and Maritime Security, DG MARE, European Commission)



#EMD2022

EMD
EUROPEAN MARITIME DAY
Ravenna
19-20 May 2022

15 years EUROPEAN MARITIME DAY

EMD 2022
Ravenna, Italy May 19 & 20

European Maritime Day 2022 is taking place again as a fully-fledged physical event, in Ravenna, Italy on May 19 and 20, 2022!

It will be co-organised by the European Commission, the Italian Ministry of Infrastructure and Sustainable Mobility, the City of Ravenna and the Region of Emilia-Romagna in Pala de Andre conference Center.

Participation, special measures, footprint

EMD 2022 conference

- Physical event
- 1000 + participants expected
- Big opening by Commissioner Virginijus Sinkevičius and key note speakers -TED talk style
- Plenaries on the latest EU maritime policies
- 20 workshops organized by stakeholders
- Pitch stage - 3 sessions
- Exhibition
- B2B meetings
- Networking activities
- EMD TV (web streaming of the opening, interviews of speakers and stakeholders, presentation of the Exhibition etc).

Special measures
Covid-19 protocols and measures in force for public events in Italy will be applied. Nevertheless, the capacity of the venue is big enough to accommodate up to 1250 participants.

Carbon footprint
CO2 emissions reduction policies will be applied. The carbon footprint of EMD will be calculated and offset by planting trees in the region of Emilia Romagna.

Apply to organise a workshop
Deadline: 5/12/2021
https://ec.europa.eu/maritimeaffairs/maritimeday/get-involved/workshops_en

2 - The Adrireef Project Storyline – A video story of the project activities

The Adrireef Staff

Here is the screenshot of the video storyline that was created to show some of the many highlights of the project activities.



3 – The reefs of the Adriatic Sea: mapping of natural and artificial reefs and selection of innovative systems for their monitoring

Gianna Fabi (Cnr – Irbim)

ADRIREEF

Contents

Mapping of the Adriatic reefs	<ul style="list-style-type: none">• Definition of Natural and Artificial reefs• Data collection• Data Base of the Adriatic reefs and wrecks• Identification of Adireef CSs
Identification of innovative and low-impact monitoring methodologies	<ul style="list-style-type: none">• Review of monitoring techniques• Selection of low-impact techniques to be applied to the Adireef CSs• Monitoring plan

FINAL DISSEMINATION EVENT **RAVENNA, 23RD – 24TH NOVEMBER 2021**

ADRIREEF

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FINAL DISSEMINATION EVENT **RAVENNA, 23RD – 24TH NOVEMBER 2021**

Definition of Natural and Artificial reefs

Mapping of natural and artificial reefs

Artificial reefs

Submerged natural or manmade structure deliberately constructed or placed on the seabed to emulate some functions of a natural reef such as protecting, regenerating, concentrating, and/or enhancing populations of living marine resources, while doing “no harm”

This definition also includes decommissioned structures, or parts of them, intentionally topped down to act as an artificial reef (e.g., rig-to-reefs, sunken ships)



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RAVENNA, 23RD – 24TH NOVEMBER 2021

Definition of Natural and Artificial reefs

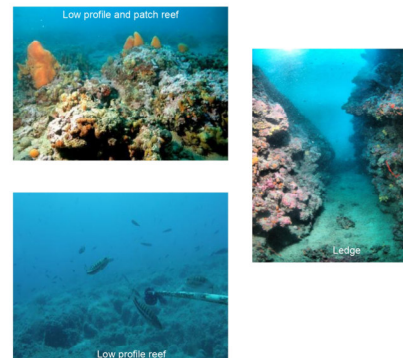
Mapping of natural and artificial reefs

Natural reefs

Biogenic or geogenic formations protruding from the solid or soft seabed with distinctive living marine resources

Categorization

- ✓ **High profile reef:** the reef protruding more than 20 m from the base substratum
- ✓ **Low profile reef:** the reef protruding less than 20 m from the base substratum
- ✓ **Ledges:** vertical reef face characterized by visible crevices
- ✓ **Boulder:** boulder structure elevating from the flat seabed
- ✓ **Patch reef:** sand bottom with reef structures protruding from the sediment



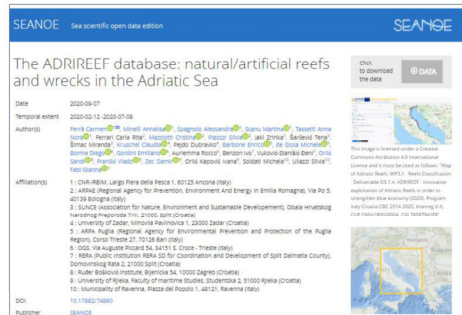
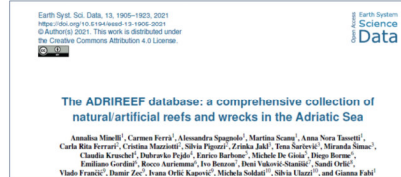
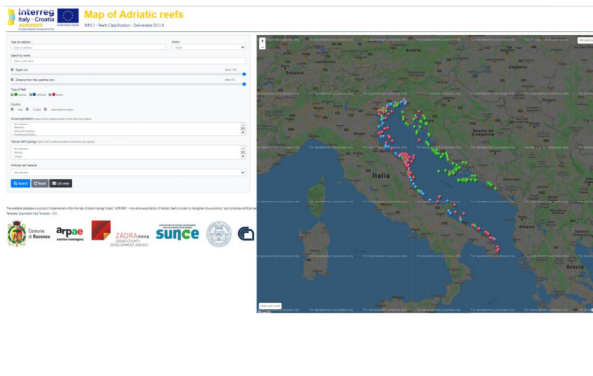
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Database of Adriatic NRs, ARs and Wrecks

Map of Adriatic reefs WEBGIS

<https://adrireef.github.io/sandbox2/>



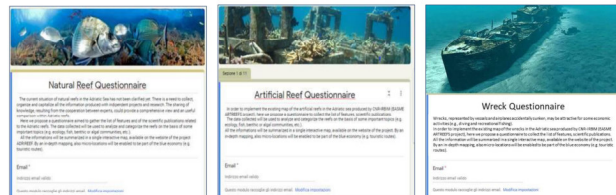
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Data collection and analysis

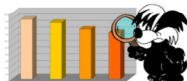
Literature and available data review:

- European environmental databases (Natura 2000, European Environmental Agency sites)
- Databases developed by CNR-IRBIM
- Scientific publications, grey literature



Survey among Adriareef PPs:

Data harmonization and analysis



Typology	Croatian waters	Italian waters	International waters	Total
Artificial reefs	-	47	-	47
Natural reefs	102	27	-	129
Wrecks	9	87	13	109
Total	111	174	13	285

FINAL DISSEMINATION EVENT

RAVENNA, 23RD – 24TH NOVEMBER 2021

ADRIREEF

Identification of Adireef Case Studies

8 CSs identified: 4 in Italian waters and 4 in Croatian waters

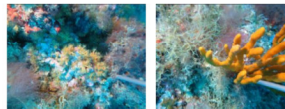
Mapping of natural and artificial reefs



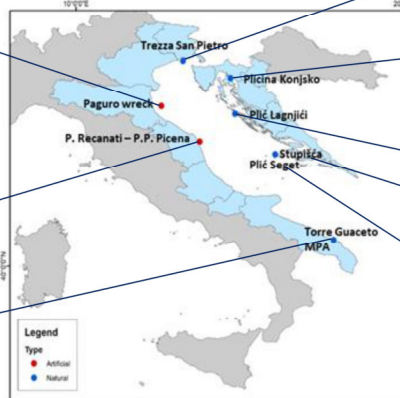
Paguro wreck AR



P.to Recanati - P.to Potenza Picena AR



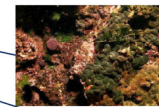
Torre Guaceto NR
(low profile reef and patch reef)



Trezza San Pietro
(patch reef)



Konjsko NR
(low profile reef)



Lagnjići NR
(low profile reef)



Seget NR (patch reef)



Stupišća NR

FINAL DISSEMINATION EVENT

RAVENNA, 23RD – 24TH NOVEMBER 2021

ADRIREEF

Contents

Mapping of the Adriatic reefs

- Definition of Natural and Artificial reefs
- Data collection
- Data Base of the Adriatic reefs and wrecks
- Identification of Adireef CSs

Identification of innovative and low-impact monitoring methodologies

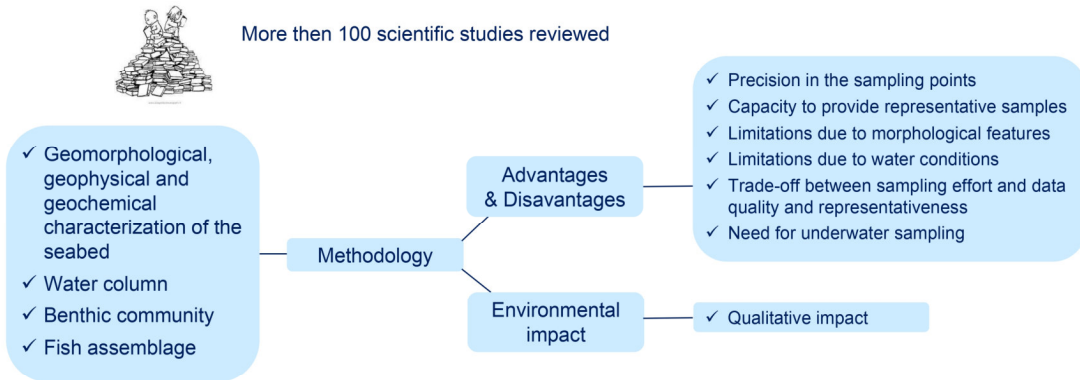
- Review of monitoring techniques
- Selection of low-impact techniques to be applied to the Adireef CSs
- Monitoring plan

FINAL DISSEMINATION EVENT

RAVENNA, 23RD – 24TH NOVEMBER 2021

Review of monitoring techniques

Identification of innovative and low-impact monitoring methodologies



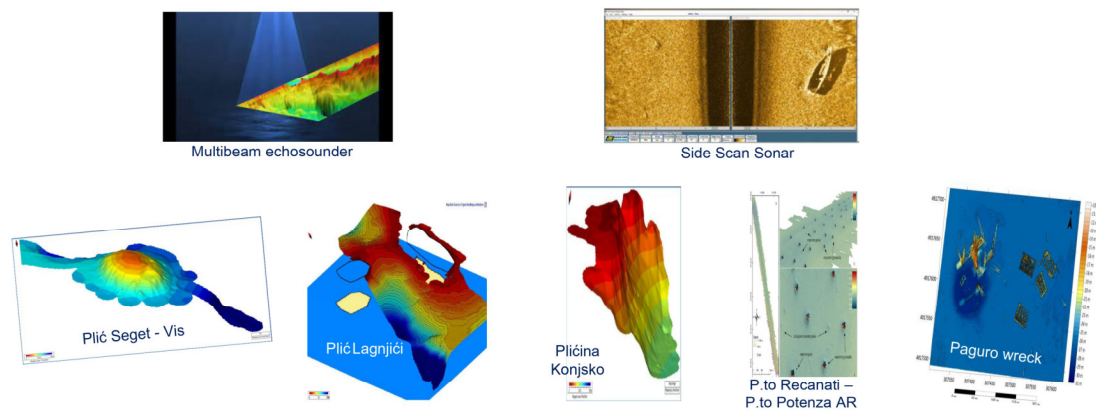
FINAL DISSEMINATION EVENT

RAVENNA, 23RD – 24TH NOVEMBER 2021

Selection of low-impact techniques to be applied to the Adireef CSs

Identification of innovative and low-impact monitoring methodologies

Geomorphological mapping



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Selection of low-impact techniques to be applied to the Adireef CSs

Identification of innovative and low-impact monitoring methodologies

Water column



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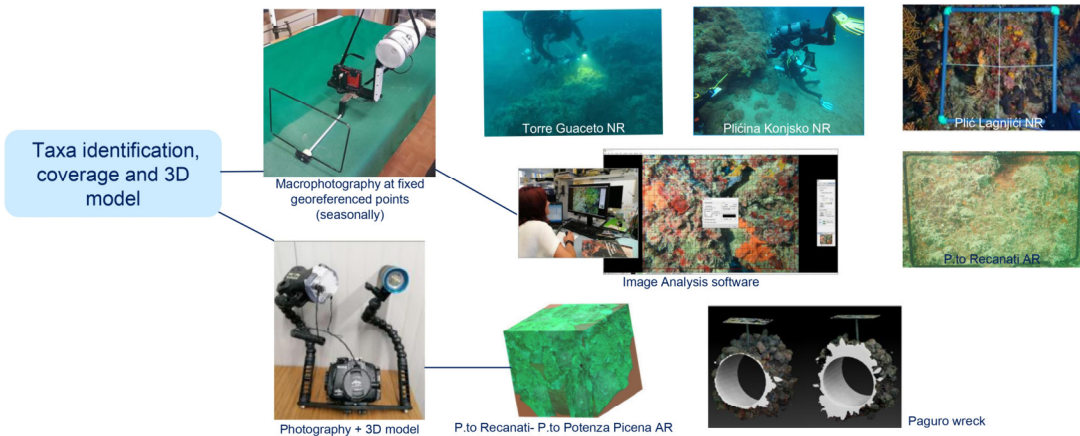
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Selection of low-impact techniques to be applied to the Adireef CSs

Identification of innovative and low-impact monitoring methodologies

Benthic community settled on the reefs



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Selection of low-impact techniques to be applied to the Adriareef CSs

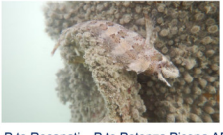
Identification of innovative and low-impact monitoring methodologies

Fish assemblage


Taxa identification, abundance and structure by size classes of the fish assemblage




UVC by scuba divers (quali-quantitative) – Transects, fixed points or mixed (monthly)




P.to Recanati – P.to Potenza Picena AR



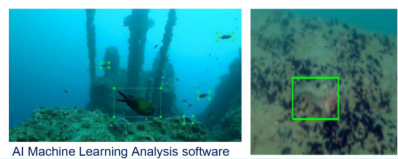
Trezza San Pietro NR



Video camera (qualitative) or stereo-videocamera (quali-quantitative) - Fixed point (monthly)



UVC with ROV or drone equipped with video camera (qualitative) or stereo-videocamera (quali-quantitative) - Transects, fixed points or mixed (monthly)



AI Machine Learning Analysis software

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Monitoring plan

Identification of innovative and low-impact monitoring methodologies

Scope	Evaluation of environmental load	Implementation of diving	Implementation of recreational and/or professional small-scale fishing	Extractive shellfish culture
Ecosystem components				
Geomorphological features (morphological characterization of the reef; map for planning the other investigations)	MBES and/or SSS mapping			
Water column	<ul style="list-style-type: none"> Current direction and speed (in continuous) Physical: T°, S, turbidity, O2 (in continuous) Chemical and microbiological: PH, Redox, nutrients Chlorophyll, CDOM, PAH, AH, E. coli (spot) 	<ul style="list-style-type: none"> Current direction and speed (in continuous) Physical parameters (T°, turbidity - in continuous) 		<ul style="list-style-type: none"> Physical: T°, S, turbidity, O2 (in continuous or spot) Chemical and microbiological: PH, Redox, nutrients Chlorophyll, CDOM, PAH, AH, E. coli (spot)
Shellfish				<ul style="list-style-type: none"> Chemical and microbiological: heavy metals, organohalogenate substances, PAH, faecal coliforms, E. coli, phycotoxins, etc. (spot)
Benthic community settled on the reef	<ul style="list-style-type: none"> Macrophotography at fixed georeferenced points (seasonally) 	<ul style="list-style-type: none"> Photos at fixed georeferenced points (seasonally) 		<ul style="list-style-type: none"> Photos + 3D model (seasonally) Eventual scraping of standard surface (seasonally)
Fish assemblage		Qualitative: <ul style="list-style-type: none"> Visual census (UVC) with ROV or drone equipped with videocamera (monthly) UVC with scuba divers (monthly) UVC on fix points with videocamera (in continuous) 	Qualitative & quantitative: <ul style="list-style-type: none"> UVC with ROV equipped with stereo-videocamera (monthly) UVC with scuba divers (monthly) UVC on fix points with stereo-videocamera (in continuous) 	
Additional methodologies for dissemination / communication	BRUV, 360° videocamera			

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THANK YOU



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4 - Monitoring of natural and artificial reefs in Italy and Croatia during ADRIREEF project
 Silvia Pigozzi (ARPAE - Emilia-Romagna Regional Agency for Prevention, Environment and Energy)

ADRIREEF

**INNOVATIVE EXPLOITATION OF ADRIATIC REEFS
 IN ORDER TO STRENGTHEN BLUE ECONOMY**

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Monitoring of natural and artificial reefs in Italy and Croatia during ADRIREEF project



Scope of Adrireef project WP4

- Monitoring of reefs is essential for continuous evaluation of their structural and ecological evolution, hence their capacity of sustaining different economic activities.
- During Adrireef WP4, monitoring activities were performed by Italian and Croatian project partners at 7 selected reefs in the Adriatic Sea, from November 2019 to September 2021.
- During the surveys, innovative technologies with low environmental impact were tested and their advantages and limitations evaluated, thus providing an insight both for the local management plans and the application of European Directives for the protection of the marine environment.
- Based on the obtained results, the identification of reef's adequacy towards a particular use among those expected by the Blue economy sectors, was evaluated, thus providing a keystone for any stakeholder interested in the sustainable use of natural and artificial reefs in the future.

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Main features of selected reefs

Case study	Trezza San Pietro	Paguro wreck	Porto Recanati - Porto Potenza Picena	Torre Guaceto Marine Protected Area	Plićina Konjsko	Plić Lagnjići	Vis Island Plić Seget
CS code	TSP	PAG	RPP	TGU	KON	LAG	SEG
Reef typology	Natural	Artificial	Artificial	Natural	Natural	Natural with shipwreck	Natural
Reef category	Patch reef (sand bottom with small reef structures protruding from the sediment)	Sunken jack-up drilling rig + additional decommissioned structures	Specifically designed concrete modules geometrically assembled to form structures and concrete poles	Low profile reef and patch reef	Low profile reef (the reef protrudes less than 20 meters from the base substratum)	Sand bottom with reef structures protruding from the sediment	Patch reef (sand bottom with small reef structures protruding from the sediment)
Distance from the coast	8.7 km	20 km	5.6 km	2 km	200 m	1 km	2.8 km
Max depth	17 m	31 m	14 m	29 m	18 m	20 m	80 m
Extension	9850 m ²	0.66 km ²	0.55 km ²	6700 m ²	0.18 km ²	0.60 km ²	0.32 km ²

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Investigated parameters

Case study	Trezza San Pietro	Paguro wreck	Porto Recanati - Porto Potenza Picena	Torre Guaceto Marine Protected Area	Pličina Korjsko	Plić Lagnjići	Vis Island Plić Seget	Vis Island Stupišća
CS code	TSP	PAG	RPP	TGU	KON	LAG	SEG	STU
Time of monitoring	from Nov 2019 to Sept 2021	from June 2019 to July 2021	from June 2019 to June 2021	from June 2019 to July 2021	from Sept 2019 to May 2021	summer 2019 spr./sum. 2020 spr./sum. 2021	June 2020 June 2021	from September to October 2020
Geomorphological mapping	•	•	•	•	•	•	•	
Water currents	•	•	•					
Water column parameters	•	•	•	•	•	•	•	
Nutrients		•	•	•	•	•	•	
Contaminants in water					•	•	•	
Contaminants in sediment		•			•	•	•	
Benthic community	•	•	•	•	•	•	•	•
Fish assemblage	•	•	•	•	•	•	•	•
Additional investigated parameters		Fouling community volume trough Photogrammetry	Contaminants in biota; Mussel population structure; Photogrammetry		Environmental load; Maritime traffic; Garbage quantities and type; Impact of lost fishing gear.	Environmental load; Impact of lost fishing gear.	Environmental load; Garbage quantities and type.	Impact of lost fishing gear.

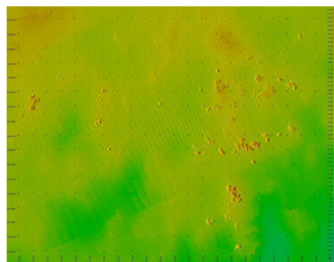
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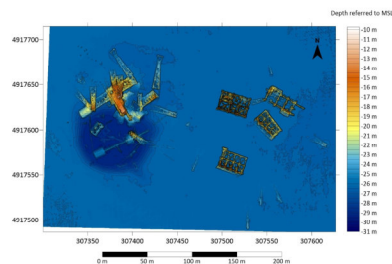
Geomorphological mapping

Seabed characterization is fundamental to evaluate extension, morphological features and integrity of a reef, producing a valuable base for geomorphological and environmental analysis.

Non-destructive acoustic measurements were done using multibeam echosounder and/or side-scan sonar, efficient tools which allow to evaluate the physical performance of reefs without creating any disturbance to the environment.



MBES bathymetric map and 3D perspective view of Trezza San Pietro outcrop area (Borne et al., 2021).



MBES bathymetric map of the artificial reef Paguro wreck (Mazziotti et al., 2021).

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Geomorphological mapping

These systems were coupled to other investigation methodologies (e.g. ROV, underwater drones, underwater Structure from Motion photogrammetry, scuba diving) for a variety of purposes.



Underwater drone and miniROV used at Croatian case studies (Cackovic et al., 2021).

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Geomorphological mapping - outputs and goals achieved

- Bathymetric maps providing detailed geomorphological description of the studied areas, thus giving information on seafloor depth range and slope, as well as spatial distribution, morphology and dimensions of artificial structures, rocky outcrops,...
- Outputs used to identify the best spot to be selected as case study, based on integrity and biological colonization of the sites.
- Outputs used for planning other investigations (e.g. the continuous water monitoring, by identifying the best location to fix the oceanographic buoy, the visual census and 3-dimensional reconstruction samplings).
- Characterization of the artificial reefs in terms of compliance with the original drawings and evaluation of their structural integrity.
- Detailed maps produced and distributed to fishers in order to enhance awareness of the project results.

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Water column parameters



Fixed near-real time oceanographic buoy deployed at Porto Recanati-Porto Potenza Picena (Fabi et al., 2021)

Measurements of physico-chemical parameters in the water column at selected case studies were carried out at different temporal and spatial scales:

- by fixed near-real time oceanographic observing systems;
- by using CTD multiprobes during oceanographic campaigns.

Water samples for additional analysis of nutrients, chemical contaminants and microbiological parameters were sampled at the surface and/or bottom layers using buckets/Niskin bottles.

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Water column parameters



<https://gr.irbim.cnr.it/adrireef>

Oceanographic buoy systems were deployed at Case Studies Porto Recanati-Porto Potenza Picena and Trezza San Pietro.

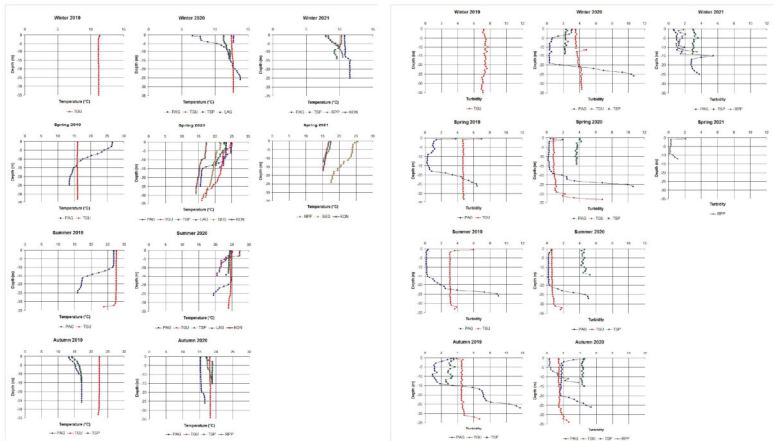
Only in Porto Recanati-Porto Potenza Picena the data were disseminated in near-real time to a wider public through dedicated free accessible dashboards, thus allowing other users (e.g. divers, recreational and professional fishers, sailors) to potentially plan in advance their activities.

Oceanographic buoy systems for continuous monitoring represent a promising technological innovation in the collection of hydrological and water column parameters, nevertheless the characteristics of the deployment site should be carefully evaluated.

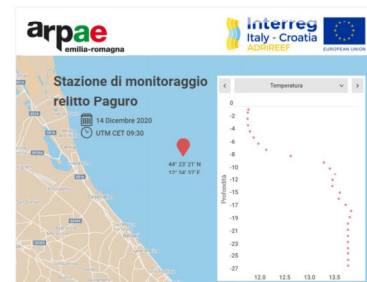
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Water column parameters



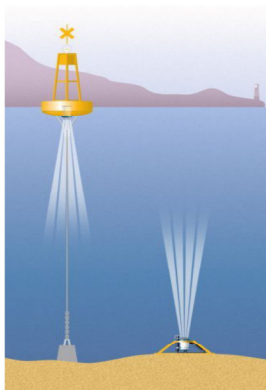
Seasonal temperature and turbidity vertical profiles recorded at CSs.



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Water currents



Currents speed and direction were recorded at three case studies, i.e. Trezza San Pietro, Paguro wreck, Porto Recanati-Potenza Picena using Acoustic Doppler Current Profilers (ADCP).

In Trezza San Pietro and Porto Recanati-Porto Potenza Picena, the ADCP had been fixed to the oceanographic buoy system at a fixed depth (at 2 and 3.5 m depth respectively) and installed downlooking. Conversely, at the Paguro wreck, the ADCP was positioned on the seabottom at a depth of 26 m and was uplooking.

At all sites, ADCPs were programmed with 1 meter wide cells where the currentmeters were measuring the current by means of acoustic signals. Speed, direction and amplitude data were stored as raw data for each of the cells.

Both in Trezza San Pietro and Porto Recanati-Porto Potenza Picena, data were transferred at land in real time, while at the Paguro wreck data were collected and analysed every 6 months.

As far as the speed of the currents is concerned, only occasionally high peaks have been recorded which could hinder the regular development of the economic activities foreseen for the CSs.

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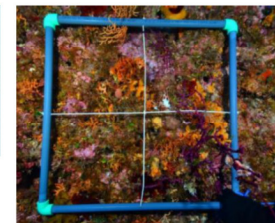
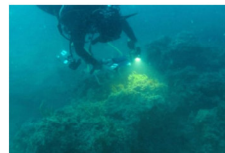
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Benthic community characterization

Case study	Sampling methods	Notes on sampling methods
Paguro wreck	Substrate scraping	biomass estimation: dry weight and wet weight
Trezza San Pietro	Photographic samplings	free technique and with the use of a standard frame
Porto Recanati	Photographic samplings	detailed analysis of mussel population structure
Torre Guaceto	Photographic samplings	sampling of standard area frames, video transect methods, video camera ROV and the video camera held by the divers
Plićina Konjsko	Photographic samplings	monitoring carried out on target species
Plić Lagnici	Photographic samplings	quadrat 50 x 50 cm and 25 x 25 cm subquadrats to ensure a more reliable identification of organisms
Vis - Stupišća	Photographic samplings	quadrat 50 x 50 cm and 25 x 25 cm subquadrats to ensure a more reliable identification of organisms
Vis - Plić Seget	Photographic samplings	quadrat 50 x 50 cm and 25 x 25 cm subquadrats to ensure a more reliable identification of organisms

Benthic community characterization

Sampling methods	Advantages and Disadvantages
Substrate scraping	<p>AD estimation of diversity not visible in photosampling (i.e. identification of small organisms), certainty of identification, conservation of individuals</p> <p>DIS destructive sampling, sampling of small areas, necessity of skilled scuba divers, greater taxonomic identification times</p>
Photographic samplings	<p>AD non-destructive sampling, sampling of large and numerous areas, ease and time of sampling, photo analysis less time consuming</p> <p>DIS estimated biodiversity reduced, small and hidden species are not visible from the photosampling, difficulties in identifying numerous taxa due to lack of taxonomic elements, sample not preserved, need for specific photographic equipment / roV</p>



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Benthic community characterization

- Despite the high variability within the monitoring data set due to different sampling approaches, similarities and differences among sites were observed and three main clusters identified:
- Torre Guaceto, Lagnjići and Stupišće sites are close from a biological point of view as they are characterized by coralligenous communities and hard bottoms of biogenic origin mainly produced by the accumulation of calcareous encrusting algae;
- Porto Recanati and the Paguro wreck, artificial reefs located on the north-western coast of the Adriatic Sea, are characterized by filter-feeding organisms. Frequent and common in both sites are cnidarians of the genus *Epizoanthus*, bryozoans and numerous encrusting sponges.
- The case study Trezza San Pietro shows a peculiar habitat that appears different from the other locations, being rich in sponges and other sessile organisms different from the other case studies of the Adrireef project.

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Fish assemblage

Case study	Sampling methods
Trezza San Pietro	Underwater Visual Census (UVC) with scuba divers operating along strip transects.
Paguro wreck	Combination of: i) visual census at stationary points with scientific scuba divers at 3 different locations; ii) 360 degree video recorded at stationary points at three different locations on the wreck; iii) stereo videos recording at one location on the wreck for automatic image classification, species identification and size estimation.
Porto Recanati	Combination of visual census methodologies: i) scuba divers visual census, ii) visual census performed through remotely operated vehicle (ROV).
Torre Guaceto	Combination of: (i) underwater visual census (UVC) at stationary point, ii) visual census performed through remotely operated vehicle (ROV). During the surveys, a GOPRO 8 and a GOPRO MAX 360° were used to record high quality videos which were then used to validate the visual census surveys performed by scuba divers.
Pličina Korjsko	Fish census method applied were: i) Baited Remote Underwater Video (BRUV), ii) Underwater Visual Census (UVC), iii) Remote Operated Vehicle (ROV).
Plić Lagnici	Fish census method applied were: i) Baited Remote Underwater Video (BRUV), ii) Underwater Visual Census (UVC), iii) Remote Operated Vehicle (ROV).
Vis - Plić Seget	Fish census method applied were: i) Baited Remote Underwater Video (BRUV), ii) Underwater Visual Census (UVC), iii) Remote Operated Vehicle (ROV).
Vis - Stupišća	Underwater Visual Census (UVC) with scuba divers.

Fish assemblage

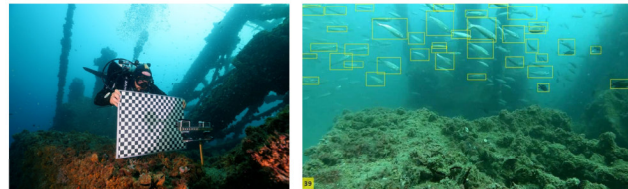


Deployment of the BRUV system in Croatian CSs (Pejdo et al., 2021).

Stereo camera calibration procedure at Paguro wreck and a video processing snapshot with automatic fish detections in overlay (Mazziotti et al., 2021).



ROV, standard and 360° cameras used at Torre Guaceto to study the fish assemblage (Barbone et al., 2021).



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Additional investigations

- Pathogenic bacteria and contaminants in seawater, sediment and biota
- Volume occupied by the fouling community through Photogrammetry
- Mussel population structure through Photogrammetry
- Environmental load (tourism, maritime traffic, diving centers, fishing activities, including garbage quantity and type)
- Impact of lost fishing gear

All performed investigations were directed at a more comprehensive definition of reef vocations, which included an indication of human activities that should be promoted at site because they follow the principles of the Blue Economy, and those that are not sustainable and therefore need to be banned or carefully managed.

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Reef vocation

ACTIVITIES



Case study	Reef vocations
Trezza San Pietro	recreational scuba diving, recreational fishing and professional small-scale fishery should be managed; freediving, scientific research and ocean literacy should be promoted
Paguro wreck	recreational scuba diving, scientific research, ocean literacy, virtual tourism
Porto Recanati	recreational fishing and/or professional small-scale fishery (fish and mussels), recreational scuba diving based on a management plan developed in agreement with the local stakeholders
Torre Guaceto	recreational scuba diving, snorkeling, scientific research, ocean literacy
Plićina Konjsko	recreational scuba diving, ocean literacy
Plić Lagnici	recreational scuba diving, snorkeling and freediving, recreational fishing, professional small-scale fishery, scientific research, ocean literacy
Vis - Plić Seget	small scale fishing, recreational scuba diving (only for advanced divers), scientific research, ocean literacy
Vis - Stupišća	recreational scuba diving, snorkeling, scientific research and ocean literacy

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Monitoring of natural and artificial reefs in Italy and Croatia during ADRIREEF project

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5 - Photogrammetry, 3d mapping & virtual reality

Marco Palma (Ubica Srl / Municipality of Ravenna)

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Photogrammetry, 3D mapping & Virtual Reality



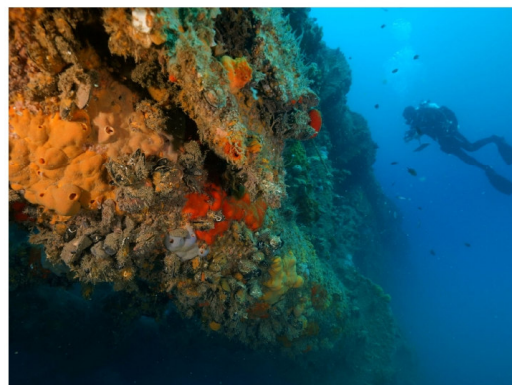
Comune
di Ravenna

arpae
emilia-romagna



Sampling campaigns:

- Photogrammetry on large sections of the wreck
- Photogrammetry on small sections of the wreck
- 360 degrees videos at stationary points
- 360 degrees videos along exploratory paths
- Stereo videos



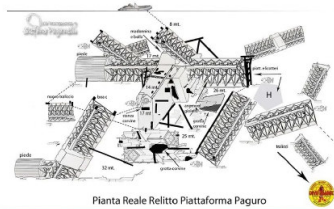
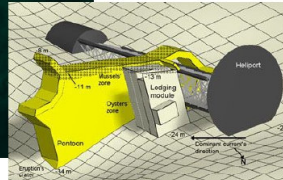
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Photogrammetry is an optical based technology for estimating the 3D structure of a scene from 2D overlapping images, acquired by a moving sensor.

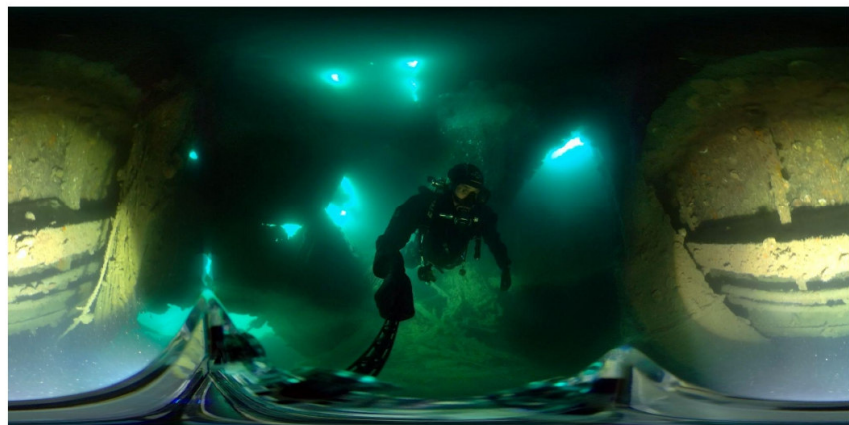
Common feature points are identified within the collected images and 3D spatial relationships are established between points.



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360 degrees videos are recorded with camera with 2 or more lenses and sensors to cover a complete view of the surroundings

The resulting video can be watched with VR headset for an immersive experience



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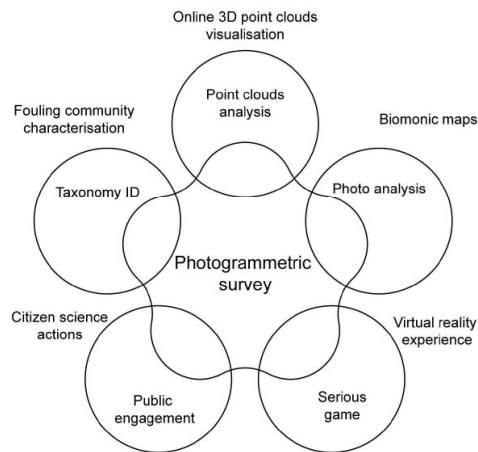


A stereo-camera system was tested by using gopro cameras calibrated with a chess board.

Cameras recorded pair videos which were then used to track and measure fishes

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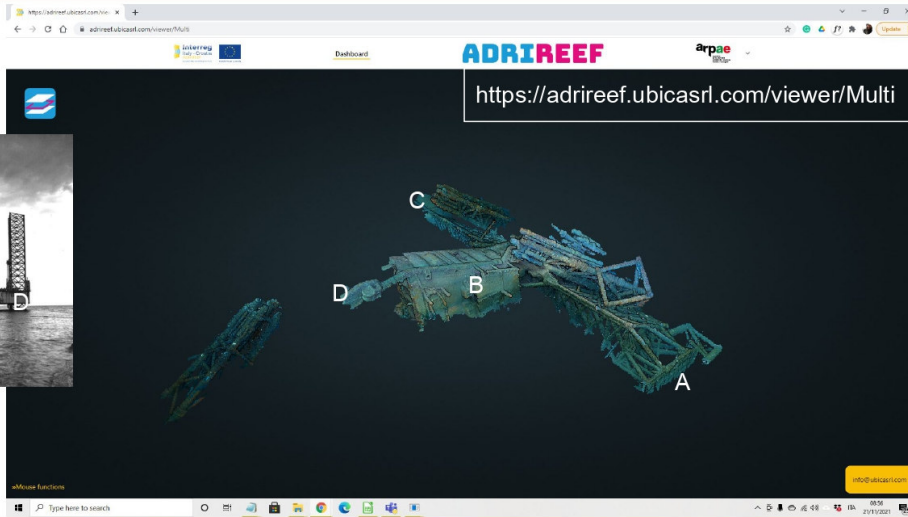
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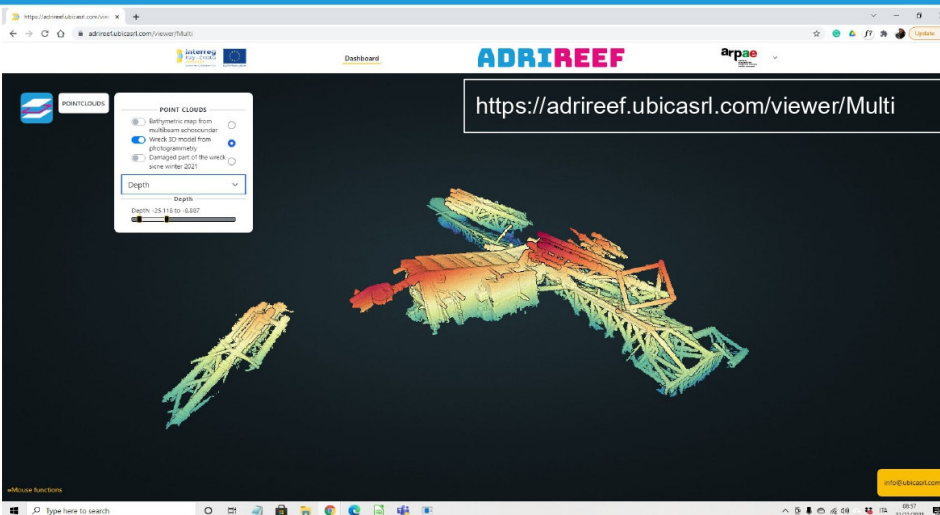
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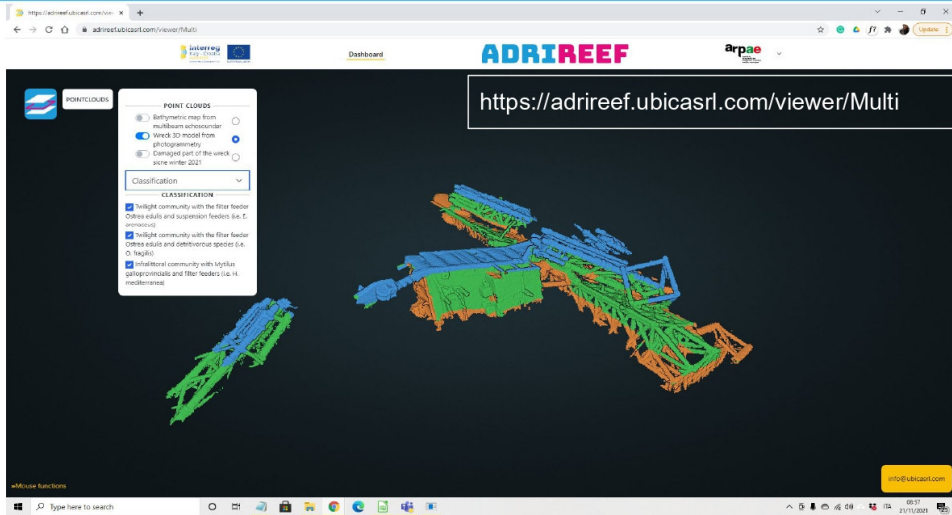
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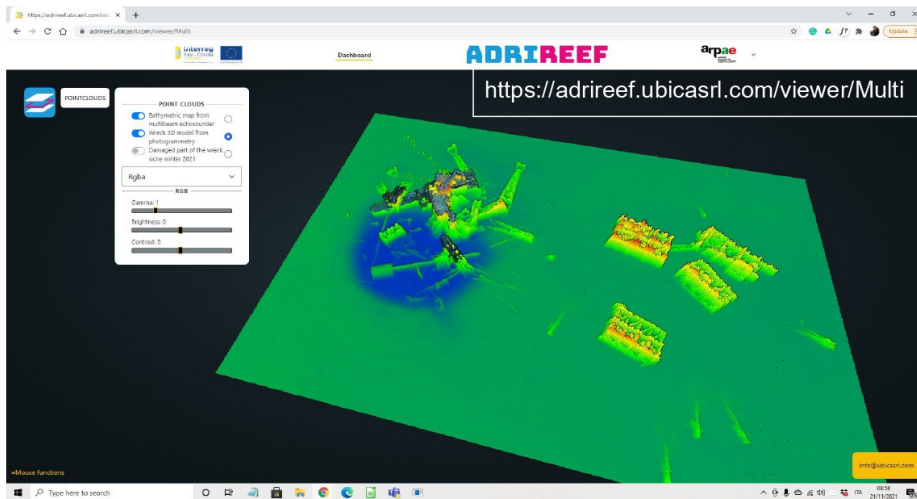
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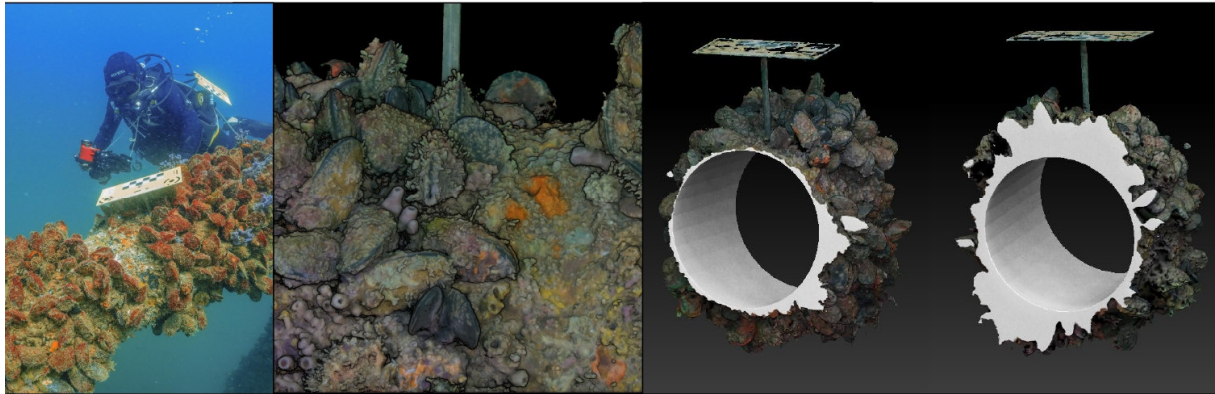


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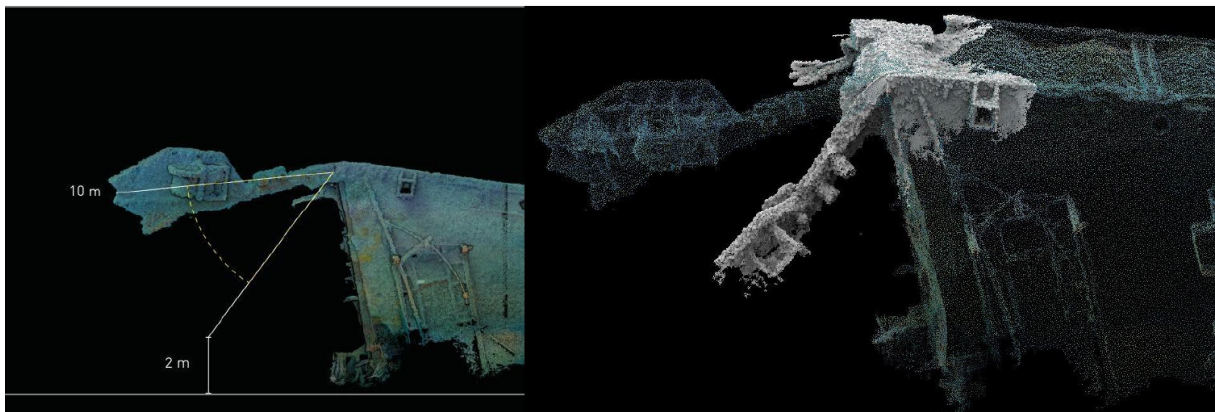


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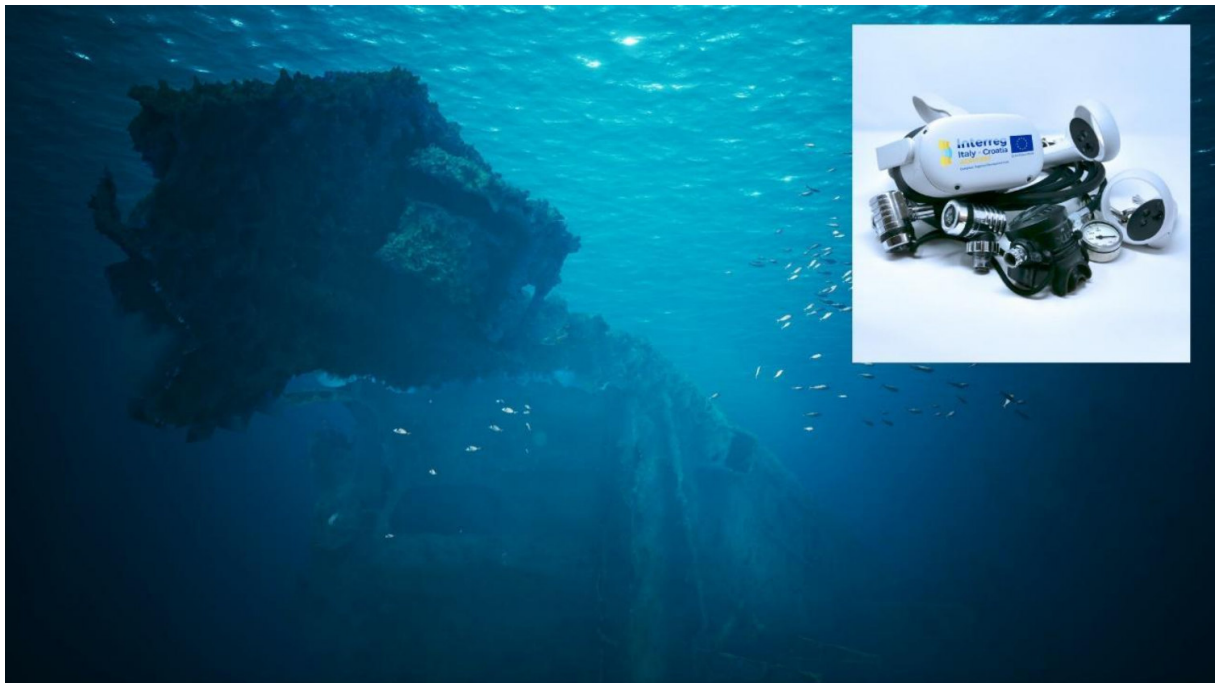
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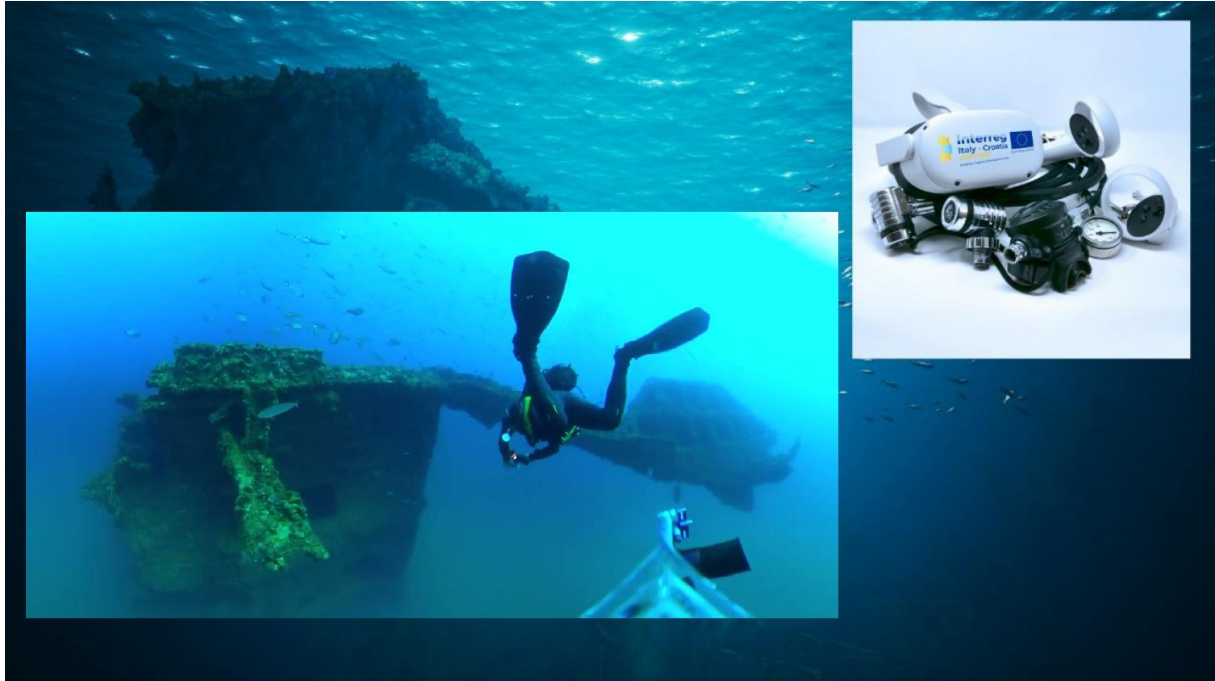
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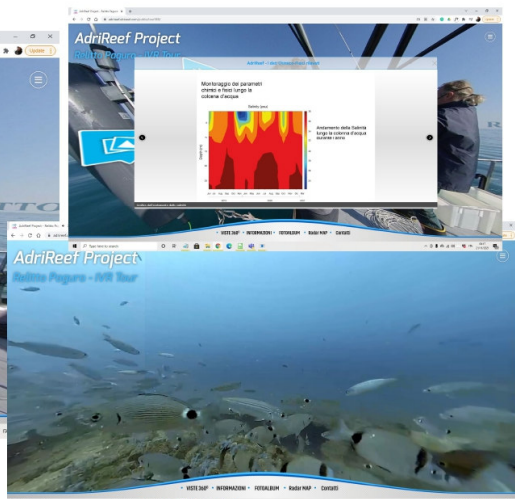
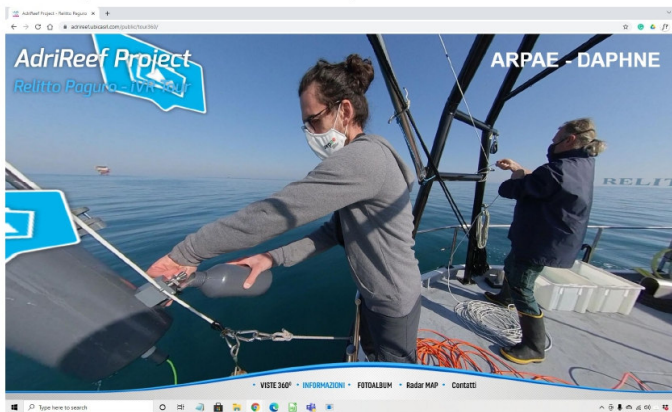
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ADRIREEF

<https://adrireef.ubicasrl.com/public/tour360/>

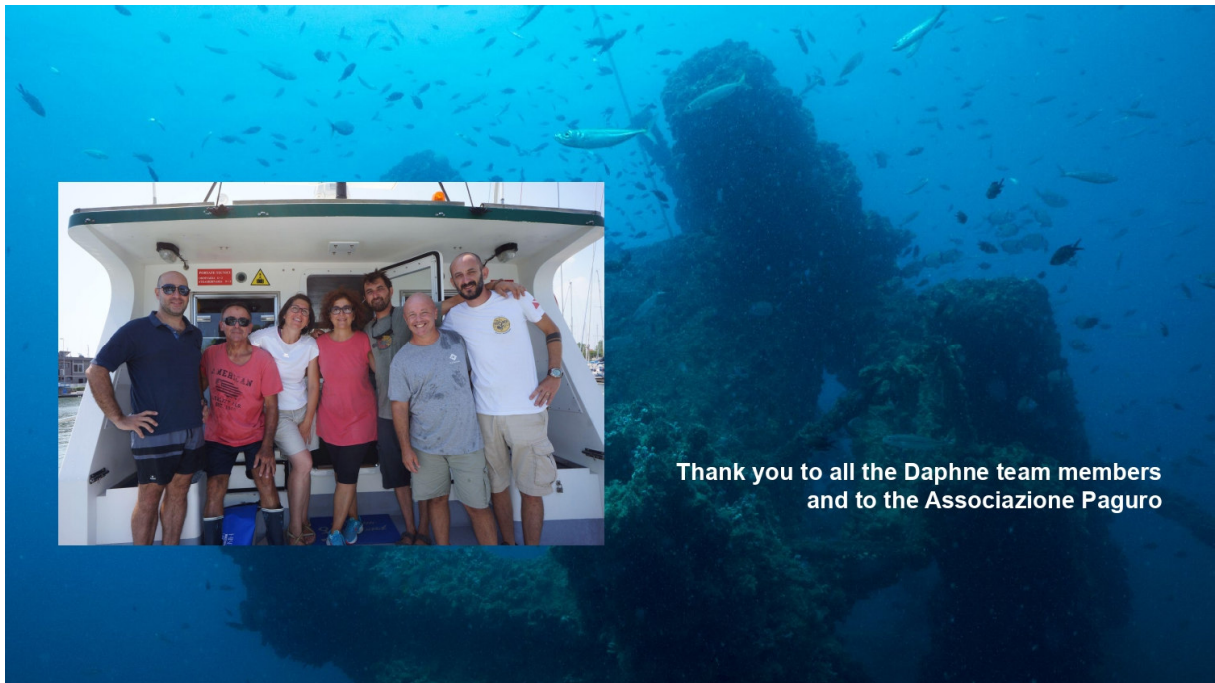


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FINAL DISSEMIN



Thank you to all the Daphne team members
and to the Associazione Paguro

6 - Near real-time oceanographic monitoring and in-land data transfer

Gianna Fabi (CNR – IRBIM)



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INNOVATIVE EXPLOITATION OF ADRIATIC REEFS IN ORDER TO STRENGTHEN BLUE ECONOMY

FINAL DISSEMINATION EVENT

RAVENNA, 23RD – 24TH NOVEMBER 2021

Case studies P.to Recanati-P.to Potenza Picena AR and Trezze San Pietro NR

P. Penna¹, F. Moro¹, D. Borme², G. Fabi¹

¹CNR-IRBIM Ancona, Italy; ²OGS Trieste, Italy



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In continuo

Scope	Evaluation of environmental load	Implementation of diving	Implementation of recreational and/or professional small-scale fishing	Extractive shellfish culture
Ecosystem components				
Geomorphological features (morphological characterization of the reef; map for planning the other investigations)	MBES and/or SSS mapping			
Water column	<ul style="list-style-type: none"> Current direction and speed (in continuous) Physical: T°, S, turbidity, O2 (in continuous) Chemical and microbiological: PH, Redox, nutrients Chlorophyll, CDOM, PAH, AH, E. coli (spot) 	<ul style="list-style-type: none"> Current direction and speed (in continuous) Physical parameters (T°, turbidity - in continuous) 		<ul style="list-style-type: none"> Physical: T°, S, turbidity, O2 (in continuous or spot) Chemical and microbiological: PH, Redox, nutrients Chlorophyll, CDOM, PAH, AH, E. coli (spot)
Shellfish				<ul style="list-style-type: none"> Chemical and microbiological: heavy metals, organohalogenate substances, PAH, faecal coliforms, E. coli, phycotoxins, etc. (spot)
Benthic community settled on the reef	<ul style="list-style-type: none"> Macrophotography at fixed georeferenced points (seasonally) 	<ul style="list-style-type: none"> Photos at fixed georeferenced points (seasonally) 		<ul style="list-style-type: none"> Photos + 3D model (seasonally) Eventual scraping of standard surface (seasonally)
Fish assemblage		Qualitative: <ul style="list-style-type: none"> Visual census (UVC) with ROV or drone equipped with videocamera (monthly) UVC with scuba divers (monthly) UVC on fix points with videocamera (in continuous) 	Qualitative & quantitative: <ul style="list-style-type: none"> UVC with ROV equipped with stereo-videocamera (monthly) UVC with scuba divers (monthly) UVC on fix points with stereo-videocamera (in continuous) 	
Additional methodologies for dissemination / communication	BRUV, 360° videocamera			

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Oceanographic Observing Buoy System

Parameter	Buoy MAMBO 2	Buoy ADRIANA
ADCP Current Meter	X	X
Water Temperature	X	X
Turbidity	X	X
Salinity	X	X
Oxygen	X	X
Wind – Speed and Gust		X
Air Temperature		X
Air Humidity		X
Atmospheric pressure		X
Continuous data acquisition	X	X
Real time communication		X
Web data presentation and sharing		X

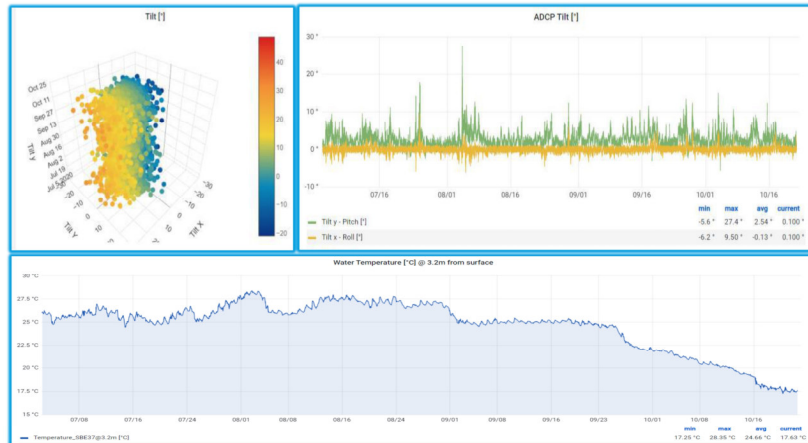
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Data Visualization:
<https://gr.irbim.cnr.it/adrireefp2>

Real-Time Data publicly available



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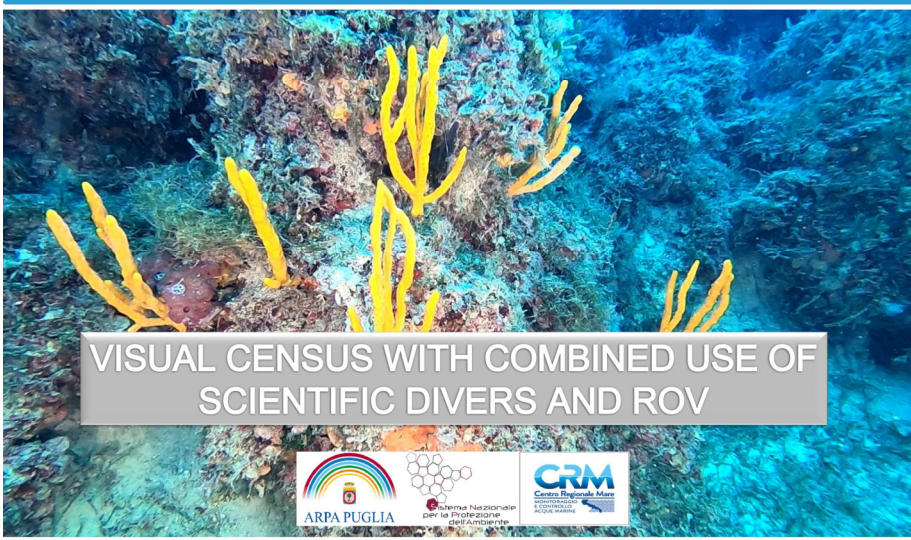
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7 - Visual census with combined use of scientific divers and roV

Enrico Barbone, Gaetano Costantino, Ilaria Dalle Mura, Marco D’onghia, Michele De Gioia, Giuseppe Strippoli, Nicola Ungaro (ARPA Puglia)




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VISUAL CENSUS WITH COMBINED USE OF SCIENTIFIC DIVERS AND ROV



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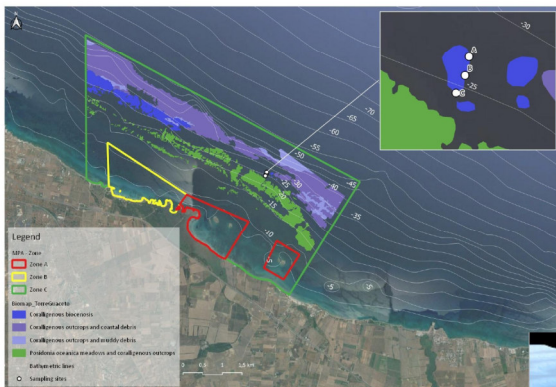
Torre Guaceto's MPA



The Torre Guaceto MPA was formally established in 1991, but entered into force in 2001. The total surface of MPA is around 2,227 ha and it is divided into two no-take/no-access zones (called A zones according to the Italian law) covering 179 ha, where any fishing activity is banned and access forbidden except for the MPA's staff, scientists and police forces (e.g. Coast Guard); the general reserve zone (B zone) covering 163 ha, where access (i.e. swimming) is permitted but fishing is banned; the partial reserve zone (C zone, hereafter called 'buffer zone' towards the exterior of the MPA), covering 1,885 ha, where access, regulated navigation and some activities are permitted.

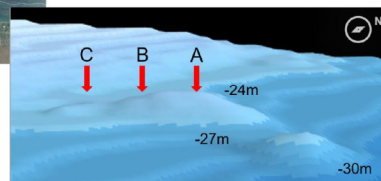
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- Biomap project archive information

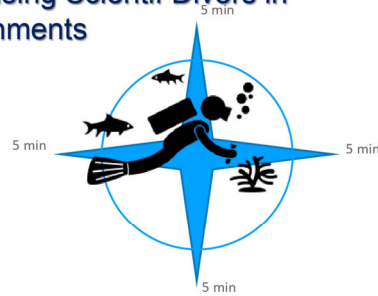
The reef, that falls into the MPA's C zone, the 'buffer zone', The geomorphological mapping shows the natural reef identified as composed by different bank-type coralligenous outcrops that create a raised structure with an overall elliptical shape, North-South oriented. This discontinuous bioconstructions lay on a bathymetry between 27/29 m depth and the top is at -24/-25 m. On the East side, there is a discontinuous vertical wall 3-4 m high. The estimated total surface of the reef is about 6,700 m², its perimeter is about 350 m and the longest axis is 140 m.



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Visual Census techniques using Scientific Divers in deep environments



Dive plan:

- Prof = - 25 m
- Visual census time for monitoring station= 20 min
- Total bottom time = 35 min
- No Decompression Limits = 40 min

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Pros:

- Visual Census in real time
- Excellent positioning on the monitoring station
- Minimal external disturbance

Cons:

- A lot of Scientific Divers to be employed (one per station)
- Greater risk of diving
- Possible decompression activity



Techniques adopted to reduce diving risk:
 Use of special air mix (Nitrox)



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Visual Census techniques using ROV



Dive Plan:

- Video transect 100m = 10 min (V= 0.1 m/sec)
- Total Visual Census time for monitoring = 60 min
- Total bottom time = 70 min

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- Pros:**
- Possibility Prolonged bottom times
 - Minimum staff employed
 - No risk of diving

- Cons:**
- Long video recording times
 - Possible Rov's battery discharge
 - Complex video post-processing
 - High noise of the ROV



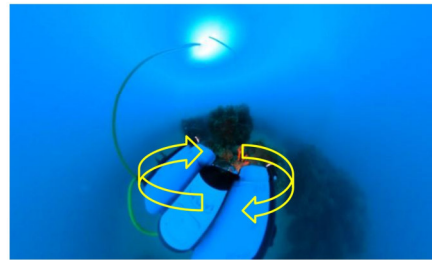
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New Visual Census Techniques with Cam 360°

Integration of Cam 360° on the ROV

With this system we have greatly reduced video recording times



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-Observation times have been reduced to 5 min in the single station for a total of 15 min.

-In the video transect, we get a wider view of the visual census to 360° and it is very similar to the observation made by a diver.

-The methodology bias could be reduced thanks to the 360° view.



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Conclusion

Dive planning at -25 m on 3 monitoring stations in comparison:

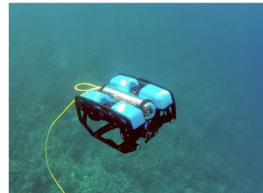
With Diver

- Visual census time for monitoring station = 20 min
- Total bottom time = 35 min
- Decompression Limits with Nitrox 36 = 45 min
- N.3 Divers



With ROV & Cam 360°

- Visual census time for monitoring stations = 15 min
- Total bottom time = 25 min
- No Time Limit
- No Divers
- No Risks



The combined use of Scientific Divers and ROVs was useful in verifying the effectiveness of the different methods, by comparing and cross-validating the data obtained from each of them.

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8 - Innovative techniques used in Croatian case study sites

Lovre Maglic (University of Rijeka - Faculty of Maritime Studies)

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INNOVATIVE TECHNIQUES USED IN CROATIAN CASE STUDY SITES

Purchased equipment

University of Rijeka

- Side scan sonar Humminbird Solix 12 CHIRP MSI+ GPS G2 + software Autochart Pro
- Underwater drone model Blueye Pioneer
- Scuba diving equipment for 3 person

University of Zadar

- Side scan sonar Humminbird Helix 12 CHIRP MSI+ GPS G3, Autochart Pro + Minn kotta electrical motor

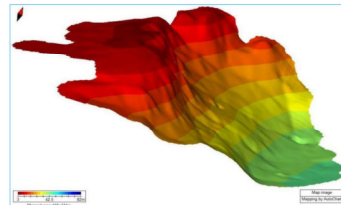
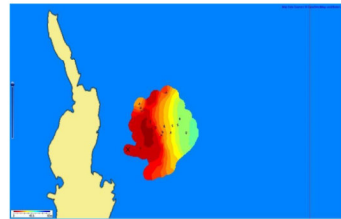
Institute Ruđer Bošković

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Side scan sonar Humminbird Solix 12 CHIRP MSI+ GPS G2

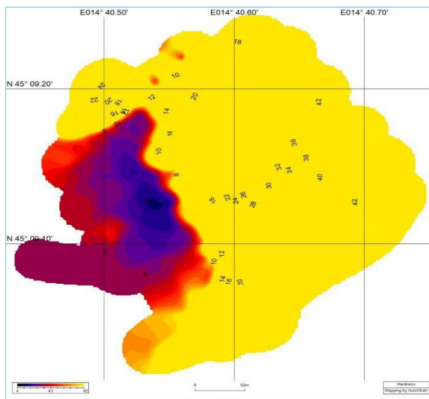


- Mapping of the reef
- Software - Autochart Pro Humminbird
- Combines tournament - ready technologies like MEGA Side Imaging+, MEGA Down Imaging+, Dual Spectrum CHIRP Sonar, AutoChart Live and intuitive Cross Touch control

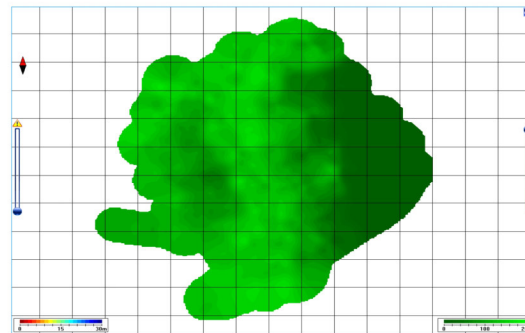
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Bottom hardness

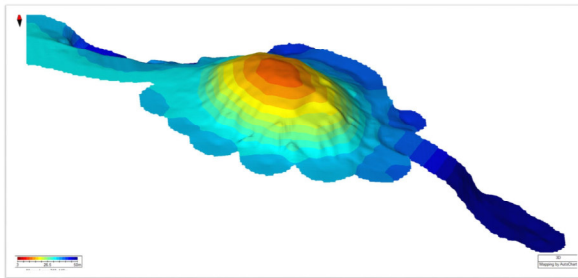


Vegetation map

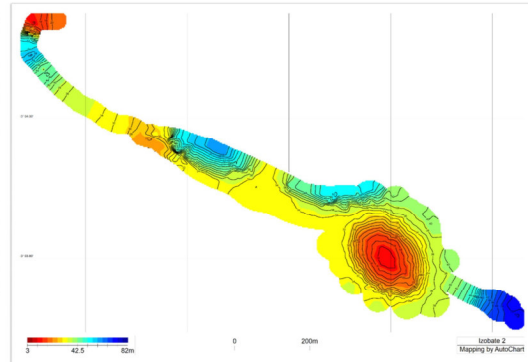
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3D depth map



2D map

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Underwater drone model Blueye Pioneer

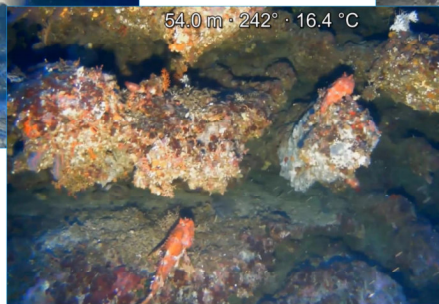
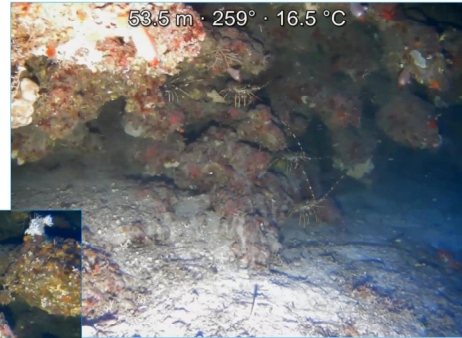


- High definition video
- Built-in FHD camera with 1080p / 30 fps wide-angle light-sensitive lens
- Powerful 3300 lumens LED lights (allows shooting at night and at great depths)
- Max. operating depth is 150 meters
- Four powerful 350 W thrusters - allows fast and precise movement in all directions

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BRUV – Baited Remote Underwater Video



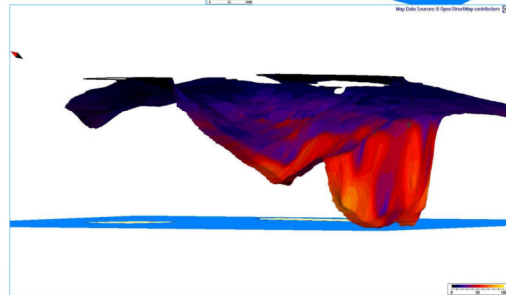
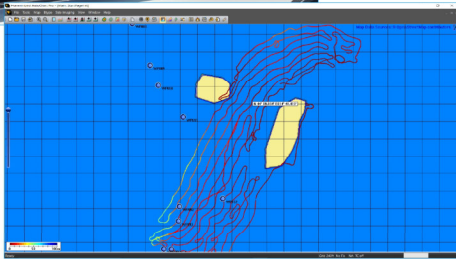
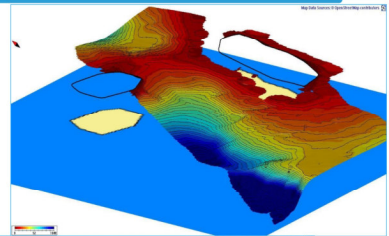
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3D – State of the art reef mapping

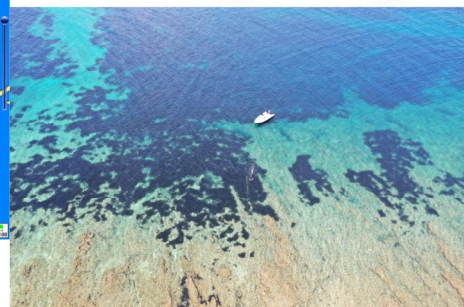
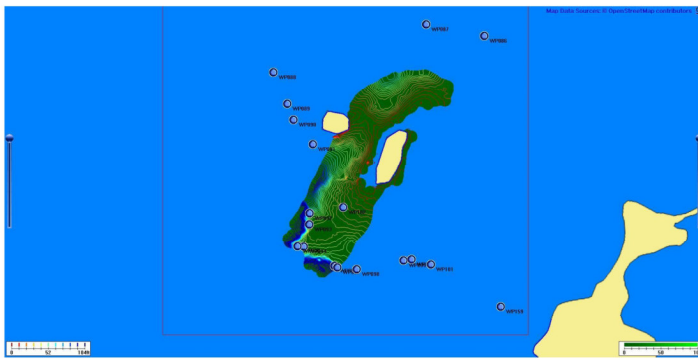


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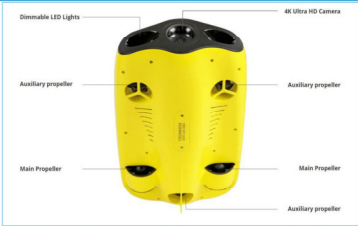
Posidonia mapping




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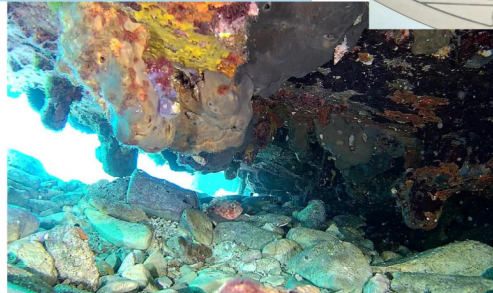

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Cryptic species problem

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Results



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9 - Natural and artificial reefs as providers of (essential) ecosystem services

Francesca Visintin (eFrame srl) - Massimiliano Pinat (CNR – IRBIM)



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IN ORDER TO STRENGTHEN BLUE ECONOMY**

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Natural and artificial reefs as providers of ecosystem services
Francesca Visintin (eFrame srl) - Massimiliano Pinat (CNR/IRBIM)

ACTIVITY 5.1 SCIENTIFIC REPORTING OF THE IN-DEPTH ANALYSIS ON ADRIATIC REEFS

Analyze the possibilities of enhancement, development and reuse of natural and artificial reefs while preserving the environment

7 PILOT CASES



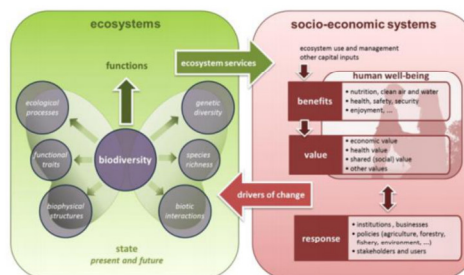
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ECOSYSTEM SERVICES ASSESSMENT



"The environment is the service provider that enables human society and the economy to exist and develop (p. 118)"



Source: Maes J., Teller A., Erhard M., Liquele C., Braat L., Berry P., Ego B., Puydarrieux P., Fiorina C., Santos F., Paracchini M.I., Keune H., Wittmer H., Hauck J., Fiala I., Verburg P., Condé S., Schägner J.P., San Miguel J., Estreguil C., Ostermann O., Barredo J.I., Pereira H.M., Stott A., Laporte V., Meiner A., Olah B., Royo Gelabert E., Spyropoulou R., Petersen J.E., Maguire C., Zal N., Achilleos E., Rubin A., Ledoux L., Brown C., Raes C., Jacobs S., Vandewalle M., Connor D., Bidoglio G. (2013). Mapping and Assessment of Ecosystems and their Services. An analytical framework for eco-system assessments under action 5 of the EU biodiversity strategy to 2020. Publications office of the European Union, Luxembourg.

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COMMON INTERNATIONAL CLASSIFICATION OF ECOSYSTEM SERVICES CICES

The CICES provides:

- a list of indicators in order to assess the benefit provided by the ecosystem to the human society
 - Capacity indicator:
 - capacity of the natural resources to provide the ecosystem service flow (e.g., in case of the "wildlife and their outputs ecosystem service", fish abundance)
 - Flow indicator:
 - flow of good and services from the ecosystem to the human society (e.g. yearly fish catches)
 - Benefit indicator:
 - economic value of the flow (e.g. market value of the fish catches)



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COMMON INTERNATIONAL CLASSIFICATION OF ECOSYSTEM SERVICES CICES

The CICES provides:

- a taxonomy of ecosystem services related to the Marine coastal water ecosystem moving from Section through to Division, Group and Class

CICES		CASCADE					Code	Description	Group	Class	1. Structure	2. Function	4. Benefit	5. Value	
Section	Division	1. Structure	2. Function	4. Benefit	5. Value										
PROVISIONING SERVICES	Beverly and nutraceuticals	Algae and nutraceuticals	Average annual yield (kg/ha)	Harvest (t/ha)	Same as primary production (kg/ha)	Same as primary production (kg/ha)	Mediator of water and trace	Substrate requirements (kg), soil requirements and biological processes	Development, condition or change of water quality	Improvement of water quality	Health value, avoided costs of water consumption (€), social and cultural values				
		Gamagrass	Same as halophytes (kg/ha)	Same as halophytes (t/ha)	Same as halophytes (kg/ha)	Same as halophytes (kg/ha)	Air quality	Urban green infrastructure (m ²)	Reduction of annual particulate	Improved air quality	Health value of clean air, avoided medical costs (€), social and cultural values				
	Fish and crustaceans	Marine pelagic fish	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Water filtration	Unfiltered turbidity and sediment (kg)	Conductance production (average rate, mg/hour)	Improved water quality	Value of gastronomic and medical uses (€), health and aesthetic values				
		Marine benthic fish	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Nutrient retention	Unfiltered turbidity (kg)	Harvest (t/ha)	Accurate adaptation	Reduced nutrient load	Health value of reduced noise environment, avoided medical costs (€), social and cultural values			
	Crops	Arable crops	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Nutrient reduction	Unfiltered turbidity (kg)	Harvest (t/ha)	Accurate adaptation	Reduced nutrient load	Health value of reduced noise environment, avoided medical costs (€), social and cultural values			
		Arable crops	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Water reduction	Unfiltered turbidity (kg)	Harvest (t/ha)	Accurate adaptation	Reduced nutrient load	Health value of reduced noise environment, avoided medical costs (€), social and cultural values			
	Wood	Wood	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Ecosystem control	Unfiltered turbidity (kg)	Harvest (t/ha)	Accurate adaptation	Reduced nutrient load	Health value of reduced noise environment, avoided medical costs (€), social and cultural values			
		Wood	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Water reduction	Unfiltered turbidity (kg)	Harvest (t/ha)	Accurate adaptation	Reduced nutrient load	Health value of reduced noise environment, avoided medical costs (€), social and cultural values			
	Other	Other	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Water reduction	Unfiltered turbidity (kg)	Harvest (t/ha)	Accurate adaptation	Reduced nutrient load	Health value of reduced noise environment, avoided medical costs (€), social and cultural values			
		Other	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Water reduction	Unfiltered turbidity (kg)	Harvest (t/ha)	Accurate adaptation	Reduced nutrient load	Health value of reduced noise environment, avoided medical costs (€), social and cultural values			
Recreation	Recreation	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Water reduction	Unfiltered turbidity (kg)	Harvest (t/ha)	Accurate adaptation	Reduced nutrient load	Health value of reduced noise environment, avoided medical costs (€), social and cultural values				
	Recreation	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Harvest (t/ha)	Water reduction	Unfiltered turbidity (kg)	Harvest (t/ha)	Accurate adaptation	Reduced nutrient load	Health value of reduced noise environment, avoided medical costs (€), social and cultural values				

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ECOSYSTEM SERVICES AND ASSESSMENT INDICATORS

WILDLIFE AND THEIR PRODUCTS

- **Capacity indicator:**
- Legal framework
- Fish abundance in the reef
- **Flow indicator:**
- Number of professional fishermen in the reef.
- Number of fishing days in the reef.
- Fish and shellfish landed (t/a) from the reef
- **Benefit indicator:**
- Market value of the fish and shellfish landed

EXPERIENTIAL AND PHYSICAL USE

- **Capacity indicator:**
- Presence and list of iconic species in the reef
- **Flow indicator:**
- Tourism flow
- Number of facilities
- **Benefit indicator:**
- Cost of the recreational activity
- Employment rate (economic operator)
- Revenue (economic operator)

SCIENTIFIC ECOSYSTEM SERVICE

- **Capacity indicator:**
- Scientific facilities (laboratory)
- **Flow indicator:**
- Number of research projects on the reef.
- Number of publications about the reef
- **Benefit indicator:**
- Projects budget.
- Employment rate

EDUCATIONAL ECOSYSTEM SERVICE

- **Capacity indicator:**
- Educational facilities (laboratory)
- **Flow indicator:**
- Number of educational activities in the reef
- **Benefit indicator:**
- Cost of educational activities.
- Employment rate (economic operator)
- Revenue (economic operator)

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DATA COLLECTION: SURVEY

Questionnaires:

- Economic operators: professional fishing, aquaculture (shellfish harvesting), diving, boat excursions
- Project partners (capacity, flow and benefit indicators)

PPs	PPs name	Case Study	Professional fishing	Aquaculture	Diving center	Boat excursions	Total
LP	Ravenna Munic.	Paguro Wreck	5 (2) [3]	2 (0) [2]	2 (2) [0]	1 (0) [1+1]	31 (5)
PP1	Arpa ER		10 (0) [3]	10 (0) [0]	1 (1) [0]	0 (n.a.)	
PP2	Zadra Nova	Plić Lagnjići	1 (0) [0]	0 (n.a.)	4 (2) [1+2]	2 (2) [0]	8 (5)
PP3	Sunce		0 (n.a.)	0 (n.a.)	1 (1) [0]	0 (n.a.)	
PP4	University Zadar		0 (n.a.)	0 (n.a.)	0 (n.a.)	0 (n.a.)	
PP5	CNR IRBIM	P.to Recanati-P.to Potenza Picena	4 (3) [0]	1 (1) [0]	1 (1) [0]	0 (n.a.)	6 (5)
PP6	Arpa Puglia	Torre Guaceto MPA	5 (5) [0]	0 (n.a.)	15 (12) [1+2]	0 (n.a.)	20 (17)
PP7	OGS	Trezza San Pietro e Bradelli	5 (3) [2]	0 (n.a.)	9 (5) [3+3]	0 (n.a.)	14 (8)
PP9	IRB	Plić Seget	0 (n.a.)	0 (n.a.)	1 (1) [0]	0 (n.a.)	1 (1)
PP10	University Rieka	Plićina Konjsko	0 (n.a.)	0 (n.a.)	2 (2) [0]	0 (n.a.)	2 (2)
Total			30 (13) [8]	13 (1) [2]	36 (27) [5+7]	3 (2) [1+1]	82 (43, 52%) [24, 29%]

Legenda: () = economic operators who are carrying out their activity in the reef, [] = interested to carry out

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STRENGTHS

Natural capital and ecosystem services. Reefs preserve high-value natural capital. Natural capital provides important ecosystem services for humans and Blue economy sectors, such as:

- "Wildlife and their products" ecosystem service, which provides food for the humans and economic development opportunities for local communities.
- "Experiential and physical use-recreation" ecosystem service, which provides the opportunity to directly experience the animal and plant worlds, marine landscapes in different environmental settings and that translates into economic opportunities for ecotourism and tourism.
- "Education" ecosystem service, which provides opportunities for environmental education, including marine science programs for the public, formal and informal learning and nature-based, cognitive tourism.
- "Scientific" ecosystem service, which provides researchers and academics with open-air laboratories where they can carry out research and monitoring activities and in which they can also include citizens through citizen science paths.

OPPORTUNITIES

Regulatory framework. Regulatory framework should include measures promoting activities with low or no environmental impact, especially those relaxing environmental pressure on natural reefs.

Pushing Blue economy sectors. Stakeholders are carrying out activities in the reef (43% of the fishermen, 8% of the shellfish harvesting economic operators, 75% of the diving centers, 67% of boat rentals). Among those who do not yet carry out but will carry out activities in the reef the percentage is variable (27% of the fishermen, 15% of the shellfish harvesting, 33% of the diving center, 67% of boat rentals).

Nature-based solutions. Although the use of artificial reefs for fish stocking remains their main purpose, several other purposes can be promoted and regulated with particular regard to those that can be developed as nature-based solutions such as protection of coastal nursery grounds against illegal trawling and protection of seagrass beds.

WEAKNESSES

Legislative framework. The lack of a legislative framework even at local level does not facilitate the adoption of management plans, except when the site is part of a protected area or a Natura 2000 site.

Uneconomic exploitation. The distance of these areas from the mainland and marine conditions make their economic exploitation uneconomic.

THREATS

Lack of legal framework. Existing legal framework does not include natural reefs nor recognizes the importance the natural reefs deserve as natural habitats.

Uncontrolled forms of exploitation. Existing legal framework (international, European national and local) does not include artificial reefs in a way that covers the entire spectrum of possible uses. This can lead to uncontrolled forms of exploitation.

FINAL DISSEMINATION EVENT

RAVENNA, 23RD – 24TH NOVEMBER 2021

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10 - The Adrireef guidelines for stakeholders & the code of conduct for reef users + The Adrireef white Paper Of Innovative Exploitation

Zadra Nova (Zadar County Development Agency)



Natural reefs



The reefs are diverse and they include habitats on a compact solid surface to the depths where the sunlight don't penetrate.



By this definition, reefs can be formations of living or dead organisms, or they can be formed without the participation of modern living or dead organisms.



They rise above the seabed and are inhabited by benthic communities in which zoning is visible (especially in shallower areas).



There are 47 artificial reefs, and they are present only in Italy. All remaining reefs are natural and most of them are located in the Croatian part of Adriatic



A total of 109 wrecks were counted, 87 in Italian territorial waters, 9 in Croatian territorial waters, and the rest in international waters.

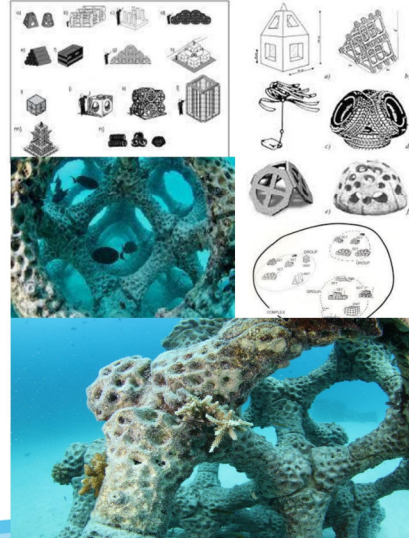
Reefs can be submarine elevations, vertical and overhanging rocks, as well as horizontal solid "shelves" on the seabed, boulders or rocky bottom with a gentle slope.

- As reefs develop in a narrow area along the coast, where the pressure of human activities is pronounced, these habitats, despite their widespread distribution along the eastern Adriatic coast, are endangered.
- It should be emphasized that they are sensitive to increased eutrophication and are threatened by submarine wastewater discharges, construction and embankment into the sea, fish and shellfish farms, marinas and harbors as well as construction in the coastal zone.
- Concreting and leveling of uneven rocky shore causes permanent damage in order to obtain areas suitable for bathers.

ARTIFICIAL REEFS

- **An artificial reef is defined as any material that is intentionally placed in the marine environment to influence the physical, biological or socio-economic processes associated with marine resources.**
- *The primary purpose of using artificial reefs was to improve fishing and diving conditions, however, their application, especially in recent decades, has been extended to increase catches in commercial and small-scale fishing, and aquaculture production, as well as habitat and coastal protection, and research and mitigation of habitat damage and loss.*
- Built artificial reefs in Europe have been developed and set up in the last 40 years, and most of them are located in the Mediterranean.

- In the Republic of Croatia, artificial reefs refer mostly to wrecks and to a lesser extent to archaeological sites
- **Built artificial reefs in Europe have been developed and set up in the last 40 years, and most of them are located in the Mediterranean.**



The reefs can be used through:

- *General use of maritime property (use is regulated by regulations relating to a particular reef)*
- *Special use of maritime domain (concessions, special permits...)*
- This means that users can access the reefs as a public good that is in public use or through a legal entity that, in accordance with regulations and contract, regulates the use of reefs.

The management of the public use of reefs as a public good is based on the regulations governing



The right to certain activities

Restrictions in the implementation of certain activities

Supervision and control over the activities carried out

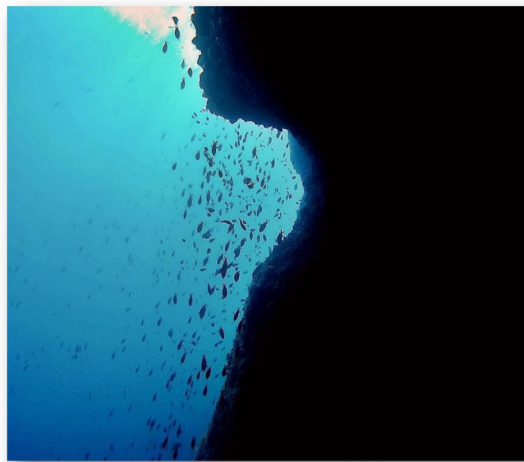
The management of activities on the reef that is in special use is based on regulations that transfer authority to the holder of the right to special use as well as supervision and control over the authorized person.

9

Legislative framework for the implementation of activities on the reefs

The difficulty in a generalized approach to drafting a legislative framework for the implementation of activities on reefs is the very definition of reefs

In this case, it is easier to identify the underwater reefs that are the subject of the frame determination and focus on the selected reefs.



Natural reefs, artificial reefs and wrecks can be found in parts of the maritime domain where they are in public use.

In that case, the regulations relating to the rights and obligations of natural and legal persons applicable in the area shall apply to the reefs.



The larger and more diverse the ridge is potentially the more attractive it is for different uses.

The great attractiveness of the reef can affect the wider coverage of the maritime domain around the reef.

Users attracted by the reef increase the required areas for anchoring or mooring, which is usually done in the immediate vicinity in shallower parts of the water area and as a result have an impact on protected habitats (eg posidonia).



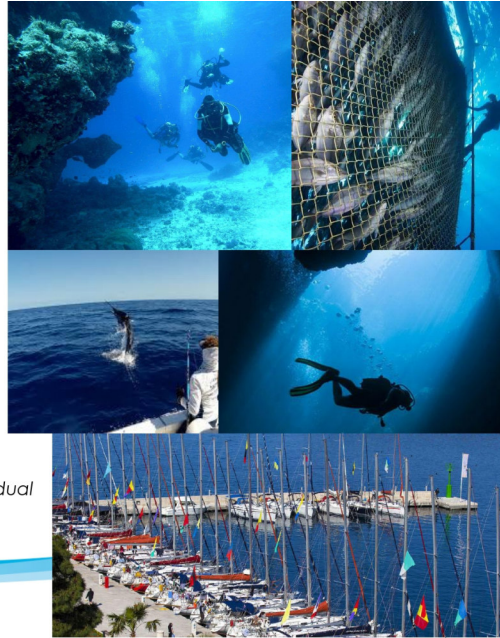
An overview of the impact of individual activities on the reef

The project includes the following activities:

- Sport fishing,
- nautical tourism,
- diving
- aquaculture.

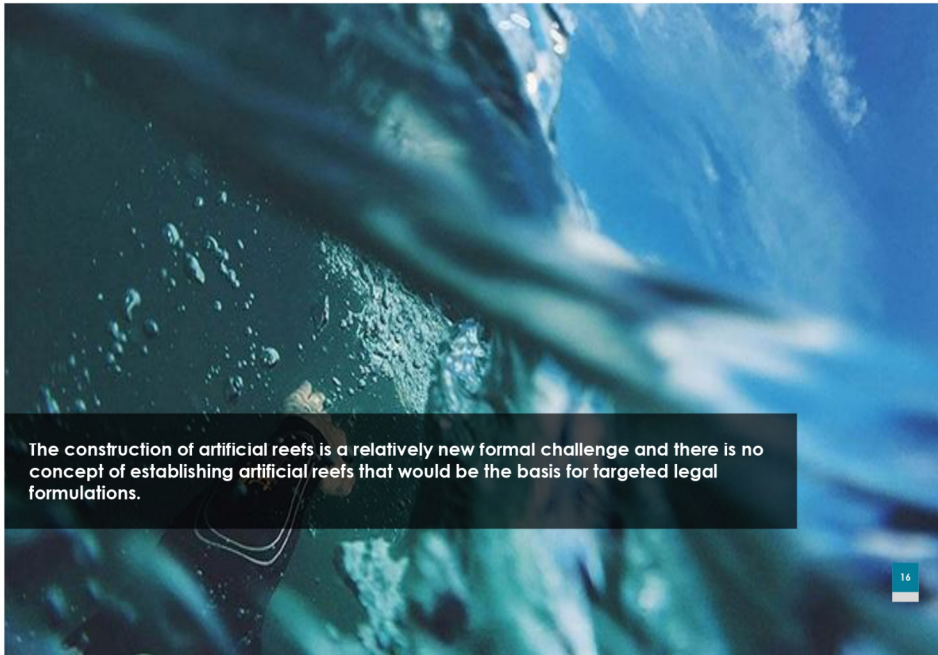
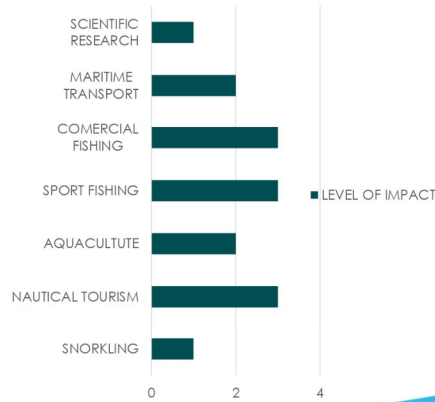
For its integrity, the **White Paper** covers commercial fishing, scientific research and navigation.

An overview of the possible impacts of individual activities on the reefs is given in the following table:



Activity	Type of impact	Possible impact	Grade of danger
Snorkling	Collecting organisms	Elimination of organisms - degradation of biological diversity	Medium
	Recording and photography	Flash usage..	Low
	Harassment....	Habitat damage	Medium
	Boat anchoring	Habitat damage	Medium
Nautical tourism	Boat anchoring	Habitat damage	High
	Waste disposal	Backfilling the reef with waste	High
	Anchoring installation	Habitat damage	Low
Aquaculture	Emission of organic matter and nutrients	Reef eutrophication	Medium
	Collection of ichthyofauna - predation on the reef	Changing the structure of the living community	Medium
	Biological and other waste from farms	Backfilling of reefs with waste, eutrophication	Medium
	Sport fishing	Catching species important for reef biodiversity	Changing the structure of the living community
Leaving fishing tackle on the reef		Backfilling the reef with waste	High
Anchoring in the reef zone and in the immediate vicinity		Habitat damage	High
Commercial fishing	Catching species important for reef biodiversity	Changing the structure of the living community	High
	Leaving fishing tackle on the reef	Backfilling the reef with waste	High
	Anchoring in the reef zone	Habitat damage	High
	Fishing nets	Habitat damage when pulling out tools	High
Sea traffic	Gliding	Accidents at sea	Low
	Waste disposal	Backfilling the reef with waste	Low
	Balast water	Invasive species	Low
Znanstvena istraživanja	Noise	Harassment	Medium
	Invasive research		Low

ACTIVITIES AND POTENTIAL IMPACT



Placing artificial reefs involves action, procedure, cost, purpose and interest that can be public or private.

- The first step in setting up an artificial reef is to determine the location for its legal and legitimate installation:
- In accordance with the purpose and goal of placing the artificial ridge, it is necessary to choose the place of placing the ridge. This includes the installation depth and the installation location.
- In the spatial-planning sense, the placement of a ridge is an intervention in space that changes the purpose of the space.
- For interventions on the maritime domain that change the purpose of the space, it is necessary to issue a location permit.
- According to the provisions of Croatian regulations, the installation of a ridge is not considered construction, but it is part of the installation of an offshore fixed object for which a location permit is issued.

The next step in setting up an artificial reef is to determine the legal interest:

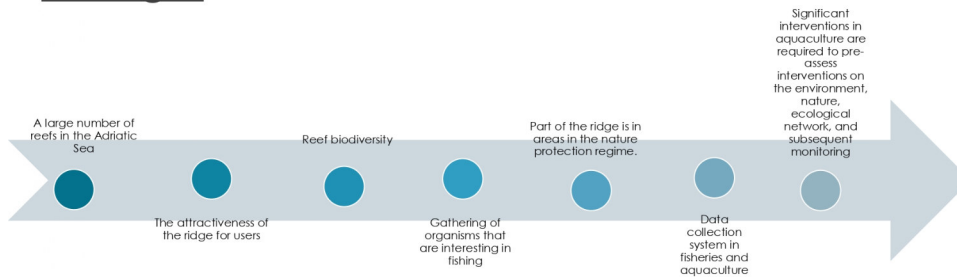
- When the installation of an artificial reef has the character of a remedial intervention in the area, the intervention has the characteristics of extraordinary management of maritime property which, in accordance with the law in the Republic of Croatia, is carried out by the counties.
- This means that when the holder of an intervention for setting up an artificial reef, which has the function of protecting, restoring or preserving organisms exposed to exploitation through, for example, fishing, a regional self-government unit may be the holder of such an intervention.
- For other forms of legal interest in setting up an artificial reef, no clear and unambiguous legal basis has been established.

- The procedure for setting up an artificial ridge in which the county is responsible for the project begins with the development of a conceptual design.
- According to the regulations governing environmental protection and nature protection, the installation of an artificial reef does not belong to the interventions for which it is necessary to carry out the environmental impact assessment procedure, as well as the assessment procedure on the need to assess the environmental impact.
- In the case where the reef site is in the area of an ecological network, a preliminary assessment of the acceptability of the intervention for the ecological network is required.
- When the conditions from the competence of environmental and nature protection have been acquired, in the process of issuing the location permit, the collection of the remaining necessary consents from the competent public law bodies follows.
- The basic document for setting up an artificial reef on a maritime domain is the preparation of a Maritime Study.

Identified opportunities for the period 2021-2028

Based on the considered results of all components of the ADRIREEF project, a SWOT analysis was made for the use of submarine reefs:

Strength



Weakness



Threats

- Growth in the number of users / visitors of the reef (small intervention of an individual summarizes a large intervention of a group)
- Destruction of reefs with fishing tools, anchors, collecting organisms (diving)
- Maritime accidents
- Sea traffic
- Invasive species
- Climate change
- Unregulated anchoring
- Intake of nutrients from the mainland

Opportunities

Selection of reefs to be included in a special category of maritime domain, which creates a basis for ecosystem management of activities on the reef

Project cooperation of competent authorities in the management of activities on the reefs

Development of management plans for selected reefs that define the activities of all competent authorities

Interventions in regulations of various competencies which legalize the implementation of management plans on the ridges

Establishment of monitoring of the situation on the reefs with the application of new non-invasive and online technology

By developing ecological network management plans, part of the reefs that are the target species in marine Natura 2000 areas will be included in the management

IMPORTANT

To determine the qualitative and quantitative composition of the communities present on the seabed and the abundance of species, in order to determine the degree of stability of the community with the aim of realizing the ecosystem reef service for the Blue Economy.

Identify indicators and ways to monitor the stability of the communities present on the seabed (biotic and abiotic factors), with the aim of sustainability of the blue economy.

Identify existing and future reef users and their interrelationships, and relationships with other stakeholders.

Define the maximum bearing capacity of the ridge taking into account the spatial, temporal and resource component of use.

Determine the performance indicators of the Blue Economy and how to monitor them for each location.

Establish supervision of the use of reefs (taking into account complex stakeholder relations and the competence of institutions).

In planning the development of the Blue Economy, it is certainly necessary to consider the impact of climate change, the effects of which have been recorded on the reefs and as such can have unforeseeable consequences on the development and planning of the Blue Economy

Guidelines for reef users

The guide is needed by reef users, ie legal or fisical persons who use the reefs by coming directly to them and carrying out activities. In addition, the guide is needed by the organizers of the visit to the reefs, animators who include the reefs in the broader context of advertising the area in which they attract users who are in a broader sense tour organizers, tourist boards and travel agencies.

The guide will introduce users to the basic legal obligations in the use of reefs.

It will warn the user of the possible harmful effects of performing activities on the reef.

Why is the guideline important?

The use of reefs can significantly affect the qualities of reef that attract users. They can damage reef structures, reduce biodiversity, reduce the presence of certain species and bury the reef with waste. Reef users are often members of diving and / or fishing societies, members of commercial fishermen's associations. When they come and individually, they are often networked through social networks, which is an informal association. All this represents an opportunity to get acquainted with the rights and formal obligations in the use of reefs. Informing about the values of the reef and invoking conscientious behavior on the other hand can contribute to the long-term use of the reef in a way that preserves its core values.

How to use this Guideline?

This guide is not a self-contained document on the basis of which the use of reefs can be approached without knowing the rights and obligations arising from the regulations relating to individual activities. The guide should be used in such a way that the user expands his knowledge necessary for the legal, legitimate and responsible conduct of activities on the reef. In this sense, the guide will provide the necessary information and guidelines for the legal performance of activities as well as the basis for good practice in carrying out activities on the ridge. The guide refers to the formal competence of individual governing bodies. This means accessing these bodies and gathering detailed information on the rights and obligations arising and their responsibilities.

Activities that could be performed on reefs

Activities carried out on reefs

- a) diving (snorkeling, scuba diving)
- c) research activities
- d) sport fishing / aquaculture

Risks posed by individual activities for reefs

- a) diving (snorkeling, scuba diving)
- c) research activities
- d) sport fishing / aquaculture

Risks posed by individual activities for users

- a) diving (snorkeling, scuba diving)
- c) research activities
- d) sport fishing / aquaculture

**White Paper and Guidelines will be distributed
in PDF format to all stakeholders by the end of
November.**

Thank you for attention!

11 - Biomimicry: approach for ecological amelioration and integration into the cultural life of the community

Ferrante Grasselli (Dipartimento di Scienze Biologiche, Geologiche ed Ambientali BiGeA, Università di Bologna, sede di Ravenna, Italia)



ADRIREEF

**INNOVATIVE EXPLOITATION OF ADRIATIC REEFS
IN ORDER TO STRENGTHEN BLUE ECONOMY**

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ADRIREEF

Biomimicry: approach for ecological amelioration and integration into the cultural life of the community



Ferrante Grasselli¹

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TESSERa

Top Engineering Solutions for Sea Eco-sustainability in Ravenna



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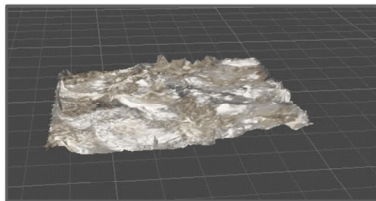
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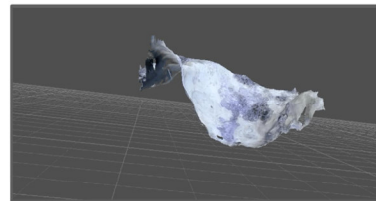
Top Engineering Solutions for Sea Eco-sustainability in Ravenna

Artificial substrate



VS

Natural substrate



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DEVELOPMENT OF BIO-MIMETIC SURFACES FOR ECO-ENGINEERING DESIGN OF COASTAL INFRASTRUCTURES

TRADITIONAL INFRASTRUCTURE

- Structural simplification for primary function only
- Low biodiversity
- Low appeal
- Poor surrogates of natural habitats

BIOMIMETIC INFRASTRUCTURE

- **Multifunctionality** (Innovation inspired by nature)
- Greater ecological value
- Greater aesthetic value
- Greater similarity with natura habitats

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• Ecological value

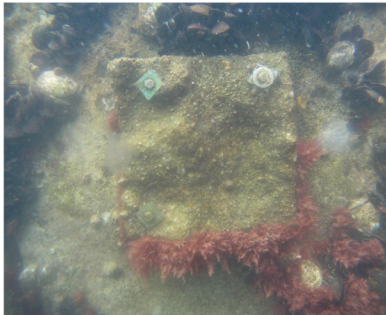


• Carbon footprint



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• Aesthetic value



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Urbanization integrated with the local cultural life



<https://awatravels.com/caorle-italy/>

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Synergistic effect of the benefits from biomimicry:

1. Support for human activities (primary function)
2. Ecological value increase (biodiversity; ecosystem services)
3. Integration with the artistic / cultural heritage (aesthetic value; public enjoyment)
4. Reduced 'up-stream' impacts (eco-sustainability)
5. Multidisciplinary and site-specificity (local activities; requirement of multiple skills)

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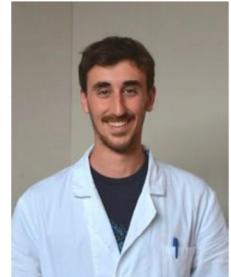
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THANKS FOR THE ATTENTION



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MEETING PHOTOS



The Adrireef Partners in Ravenna city center



One of the speakers of the final event



The coordinator of the event introduces the session



Conference room and participants



Conference room and participants



Site visit to one of the stakeholders' premises Live streaming speakers and debate

THE EXHIBITION

A photo exhibition called *A journey in the daily life of the "cozzari": the local fishermen of the wild mussel of Marina di Ravenna* was organized during the period of the final event in the same building of the meetings. Here are some of the photos.



LA SELVAGGIA DI MARINA DI RAVENNA

La cozza di Marina cresce "selvaggia", cioè spontaneamente, attaccata agli scogli o ai piloni delle piattaforme Eni.

Le cooperative di pesca La Romagnola e il Nuovo Conisub gestiscono questa pesca così particolare rispettando i regolamenti Eni, osservando le regole legate alla pesca e, soprattutto, nel rispetto della natura marina.

Le cozze vivono ad una profondità di circa 10 metri e i pescatori subacquei si immergono con tutta la strumentazione idonea alla loro sicurezza. Raccolgono a mano le cozze migliori, le issano a bordo, le lavano e le confezionano pronte per essere destinate ai banchi di vendita.

Le cozze dell'area romagnola sono le migliori d'Europa, le acque sono ricche di nutrimento, le correnti contribuiscono alla loro purezza, il clima è ideale e anche i numerosi corsi d'acqua dolce che si riversano in questo tratto di mare ne determinano la maggiore o minore salinità.

Le cozze selvagge di Marina di Ravenna non necessitano di alcun trattamento, vivono e crescono in acque controllate e i pescatori delle due cooperative sono ben attenti al loro habitat.

E' un lavoro duro, forse un po' di nicchia, non molto conosciuto anche agli abitanti del luogo, ma è un'eccellenza della nostra riviera e nonostante la fatica, i pescatori di cozze dicono "per nulla al mondo cambieremo il mestiere di pescatore di cozze che sa di salsedine, vento e libertà".

I due fotografi, Franco Ferretti e Giovanni Segurini, hanno trascorso diverse ore a bordo delle barche per documentarne le varie fasi della pesca e successivamente, arrivati in porto, sulla banchina, il lavoro di scarico delle cozze. Si prefiggono, attraverso questo progetto fotografico, effettuato in collaborazione con le due cooperative, di documentare e far conoscere a quanti ancora non lo conoscessero, il lavoro di questi uomini, del loro impegno e sottolineare la qualità e l'unicità della cozza "La Selvaggia".

Doriana Rambelli



Nasce a Ravenna nel 1990.

Depo aver conseguito gli studi come disegnatore tecnico, alla fine degli anni '70, inizio a lavorare presso un laboratorio fotografico, occupandomi della stampa del grande formato.

Nel contesto, frequento fotografi professionisti dell'epoca, che accrescono la mia curiosità nei vari ambiti dell'arte fotografica, dalla tecnica in generale alla sperimentazione personale del bianco e nero in camera oscura.

Per molti anni la macchina fotografica mi accompagna nei miei viaggi in varie parti del mondo, e con lei ho raccolto i momenti significativi delle mie esperienze, vissute sempre come ricerca, interazione e apprendimento di ciò che si scopre attraverso uno sguardo attento alla vita, alle componenti sociali e alle diverse culture.

La passione per la fotografia mi ha seguito negli anni, e molto ho appreso da letture di riviste, pubblicazioni, visitando mostre di grandi autori, soprattutto fotogiornalismo documentativo di grandi eventi sociali e politici.

La recente maggiore disponibilità di tempo libero, mi ha avvicinato al nuovo mondo fotografico digitale, di cui ho approfondito le conoscenze cercando di confrontarlo e conciliarlo con il metodo analogico, da me mai dimenticato e ancora oggi mio grande punto di riferimento.

Considero l'evoluzione degli strumenti fotografici un grande vantaggio in tutti i sensi, e la tecnologia sempre una meravigliosa fonte di scoperte, pur mantenendo integro il mio concetto di fotografia intesa come un processo e mai come un semplice prodotto.

Il mio intento fotografico è riuscire ad esprimere l'energia che avverto, interpretarne in senso artistico qualsiasi elemento il mio obiettivo possa catturare, in modo da inserire nell'attimo anche me stesso.

Auspico che le mie scelte fotografiche possano proseguire a regalarmi emozioni, mantenere la giusta frequenza con l'esterno, e attraverso i miei progetti comunicare una visione sincera di autentica passione, in un'epoca nella quale la cultura visuale è spesso distorta e sovrappiatta da altre esigenze.



Dice spesso:

"sia che si fotografi dietro l'angolo di casa o dall'altra parte del mondo, i protagonisti delle mie fotografie sono spesso gli uomini, le donne, i bambini.

Sono loro che danno un senso all'essere lì, in quel luogo e in quel tempo, e che donano valore all'esistenza stessa del fotografo".

"Siamo attratti dal diverso, diverso per etnia o per il colore della pelle o il taglio degli occhi, attraverso la fotografia si cerca di mettere in evidenza quelle diversità, ma, al tempo stesso, attraverso quei volti a volte segnati dal tempo e dalla fatica del vivere, si ritrova la parte più intima di noi stessi: le stesse emozioni, le stesse paure, le stesse gioie; quando si entra nello sguardo di coloro che ci accolgono, si avverte la loro stessa emozione, quella più pura, più semplice e che si porterà con sé stessi al di là dello scatto fotografico."

Docente di corsi di fotografia digitale e post produzione, vive a Conselice fin dal 1953 anno di nascita.

Fotografo per passione da quando era adolescente, pratica la fotografia in tutti i suoi aspetti prediligendo i reportage di viaggio ma non solo, amando documentare anche il proprio territorio ed i suoi abitanti.

Ha lavorato e collabora a diversi progetti di avvicinamento alla fotografia sia per i ragazzi all'interno delle scuole secondarie locali, sia pe adulti.

E' stato ideatore della pièce E' mi paes, spettacolo con musica, canto, recitazione e fotografia che ha realizzato in collaborazione con altri artisti locali, alla quale ha fatto seguito la mostra collettiva fotografica dal titolo Racconti.

Ha realizzato diverse mostre fotografiche personali e collettive mettendo sempre al centro l'uomo, protagonista in assoluto della sua opera fotografica.



Photo from the exhibition



Photo from the exhibition



Photo from the exhibition



Photo from the exhibition



Photo from the exhibition

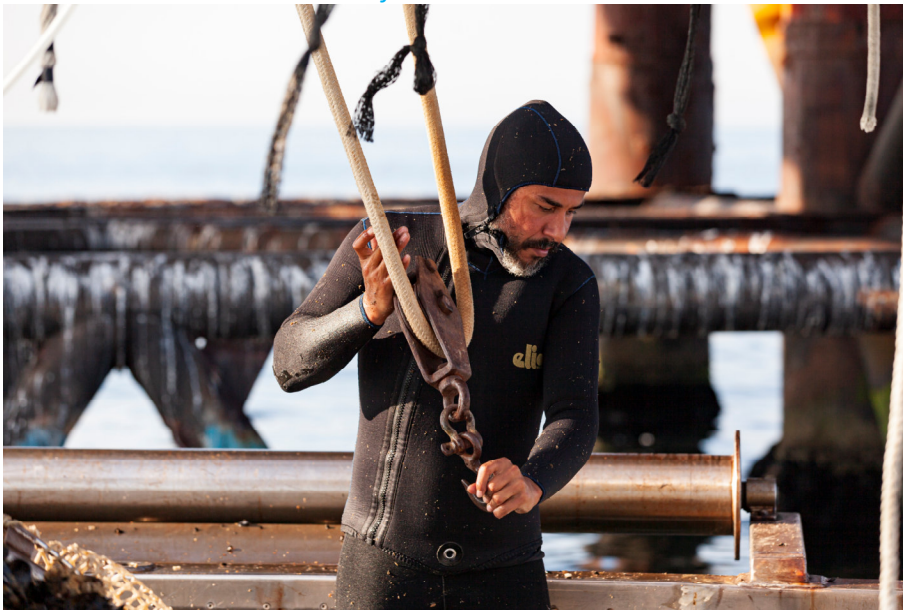


Photo from the exhibition