AdriaClim

Climate change information, monitoring and management tools for adaptation strategies in Adriatic coastal areas

Project ID: 10252001

D.2.2.7. Texts for the leaflet and other material to be distributed during the info-days

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Prject Title: Climate change information, monitoring and management tools for adaptation strategies in Adriatic coastal areas

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Work Package Number: WP2

Work Package Title: Communication

Activity Number: 2.2.7.

Activity Title Texts for the leaflet and other material to be distributed during the info-days

Contents

Texts for leaflet

CHI SIAMO

Diciannove partner dall'Italia e dalla Croazia impegnati nella ricerca di soluzioni per contrastare gli effetti del cambiamento climatico sulle coste e sulle isole del mare Adriatico.

LEAD PARTNER

Arpae - Agenzia regionale per la prevenzione, l'ambiente e l'energia dell'Emilia-Romagna

PARTNER DEL PROGETTO

CNR-ISMAR (IT) / ARPA Veneto (IT) / Agenzia per lo Sviluppo della provincia di Zadar ZADRA NOVA (HR) / Provincia di Dubrovnik Neretva (HR) / Istituto Ruđer Bošković (HR) / RERA Split – Provincia della Dalmazia (HR) / Istituto di Oceanografia e Pesca (I-RE) / Regione Puglia (IT) / Fondazione CMCC (IT) / Università di Bologna (IT) / ARPA FVG (IT) / ISPRA (IT) / Regione Marche (IT) / ULSS3 Serenissima (IT) / Regione Molise (IT) / Regione Emilia-Romagna (IT) / Città di Venezia (IT) / Regione dell'Istria (HR)

AdriaClim è finanziato dal programma Interreg Italia-Croazia.

Interreg è uno degli strumenti chiave dell'Unione Europea (UE) che promuove la cooperazione transfrontaliera tra Italia e Croazia finanziando progetti mirati alla risoluzione di problemi attraverso lo scambio di conoscenze ed esperienze in tutti i settori e migliorando la qualità della vita di più di 12,4 milioni di abitanti.

Fondo Europeo di Sviluppo Regionale

PARTNER DEL PROGETTO

CONTATTI

Agenzia regionale per la prevenzione, l'ambiente e l'energia dell'Emilia-Romagna (Arpae)

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Scopri di più su AdriaClim

www.italy-croatia.eu/adriaclim

AdriaClim

informazioni, monitoraggio e strumenti di gestione per le strategie di adattamento al cambiamento climatico nelle aree costiere dell'Adriatico

Proteggi la costa, adattati al cambiamento climatico!

Fondo Europeo di Sviluppo Regionale

ADRIACLIM

AdriaClim è un nuovo progetto di cooperazione transfrontaliera che promuove lo sviluppo di piani di adattamento ad alto contenuto scientifico, per adattarsi agli effetti del cambiamento climatico e alle sfide che ne derivano e per trasformare potenziali minacce in opportunità economiche. AdriaClim svilupperà piani di adattamento regionali e locali basati su nuove e aggiornate informazioni meteorologiche e oceanografiche per il mare Adriatico.

OBIETTIVI DEL PROGETTO

L'obiettivo di AdriaClim è migliorare la capacità di sviluppo di nuovi piani per l'adattamento al cambiamento climatico nell'Adriatico e l'aggiornamento di quelli già esistenti. Nell'ambito del progetto saranno sviluppate strategie per mitigare gli impatti sulle aree costiere e marine a rischio. AdriaClim migliorerà la cooperazione sui sistemi di monitoraggio e di modellistica e verrà sviluppato un sistema informativo avanzato, con indicatori e strumenti specifici per pianificare in maniera ottimale l'adattamento al cambiamento climatico.

PERCHÉ ADRIACLIM?

Le zone costiere e marine sono particolarmente vulnerabili agli effetti del cambiamento climatico.

Entro il 2050, secondo il "Piano Nazionale di Adattamento ai Cambiamenti Climatici (PNACC)" realizzato nel 2017, si suppone che nel mare Adriatico si verificheranno i seguenti effetti del cambiamento climatico:

- La temperatura del mare Adriatico aumenterà di circa + 1.5 / 1.6 ° C
- Il livello marino salirà di 7 cm, con possibile incremento dell'erosione costiera
- L'aumento di temperatura e volume porterà a un incremento della salinità
- La salinizzazione dell'acqua dolce e degli acquiferi sarà sempre più frequente
- Gli effetti avversi sull'ecosistema marino saranno inevitabili

OUTPUT

In Italia e in Croazia il monitoraggio, la modellistica e l'adattamento climatico sono necessari per contrastare gli impatti negativi del cambiamento climatico e trasformare potenziali minacce in opportunità economiche.

AdriaClim mira a raggiungere i seguenti risultati:

- Sviluppare informazioni accurate in grado di promuovere lo sviluppo di piani regionali e locali per l'adattamento al cambiamento climatico
- Pianificare un adeguamento della fascia costiera per un'economia blu sostenibile, basata su informazioni accurate e affidabili
- Contribuire a colmare le lacune nei sistemi di osservazione già esistenti e migliorare la capacità di modellizzazione sviluppando modelli integrati ad alta risoluzione
- Consolidare la pianificazione di misure per rafforzare la capacità di adattamento in Italia e in Croazia costruendo una cooperazione transfrontaliera che continui anche dopo la fine del progetto

I NUMERI DEL PROGETTO

DURATA DEL PROGETTO
01/01/2020 - 31/12/2022

BUDGET TOTALE
8.823.415,00 €

FESR
7.499.902,75 €

RISULTATI

AdriaClim affronta le sfide territoriali individuate attraverso un piano di lavoro strutturato e preciso che porterà a risultati:

- **integrati**
  rischi e impatti climatici sulle aree marine e costiere inclusi nella pianificazione
- **co-progettati**
  partnership con attori esterni
- **olistici**
  miglioramento del sistema di monitoraggio e proposta di soluzioni
- **distribuiti geograficamente**
  le attività coinvolgono quasi tutte le regioni costiere dell'Adriatico
- **tangibili**
  sviluppo di piani di adattamento climatico per 9 aree pilota (6 italiane e 3 croate)
- **disponibili**
  condivisione delle conoscenze e sviluppo di capacità
- **a lungo termine**
  creazione di un Gruppo Transnazionale di Esperti nella Gestione delle tematiche del cambiamento climatico (Transnational Expert Management Body)
- **complementari**
  le attività previste sono completamente integrate nei sistemi esistenti

TKO SMO

Devetnaest partnera iz Italije i Hrvatske uključenih u pronalaženje rješenja za posljedice klimatskih promjena u priobalnom području i na otocima jadranskog mora.

GLAVNI PARTNER

Arpae - Regionalna agencija za prevenciju, okoliš i energiju regije Emilia Romagna

PARTNERI PROJEKTA

CNR-ISMAR (IT) / ARPA Veneto (IT) / Agencija za razvoj Zadarske županije ZADRA NOVA (HR) / Dubrovačko-neretvanska županija (HR) / Institut Ruđer Bošković (HR) / RERA Splitsko-dalmatinske županije (HR) / Institut za oceanografiju i ribarstvo (HR) / Regija Apulija (IT) / Zaklada CMCC (IT) / Sveučilište u Bologni (IT) / ARPA FVG (IT) / ISPRA (IT) / Regija Marke (IT) / ULSS3 Serenissima (IT) / Regija Molise (IT) / Regija Emilia Romagna (IT) / Grad Venecija (IT) / Istra (HR)

Projekt ADRIACLIM financira se programom Interreg Italija-Hrvatska.

Interreg je jedan od ključnih instrumenata Europske unije (EU) kojim se podupire prekogranična suradnja između Italije i Hrvatske financijskim sredstvima zajedničkih projekata kojima se razmjenom znanja i iskustava u svim segmentima nastoje riješiti problemi te poboljšati kvaliteta života više od 12,4 milijuna stanovnika tog područja.

Europski fond za regionalni razvoj

PARTNERI PROJEKTA

KONTAKT

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Više o projektu AdriaClim
www.italy-croatia.eu/adriaclim

AdriaClim

Informiranje, praćenje i alati za upravljanje strategijama prilagodbe klimatskim promjenama u jadranskom području

Zaštitimo obalu, prilagodimo se klimatskim promjenama!

Europski fond za regionalni razvoj

ADRIACLIM

AdriaClim novi je projekt prekogranične suradnje kojim se podupire razvoj znanstvenih planova za prilagodbu posljedicama trenutačnih klimatskih promjena i razvrsno pred nama te za pretvaranje potencijalnih prijetnji u gospodarske prilike. Projektom AdriaClim izradit će se regionalni i lokalni planovi prilagodbe na temelju najnovijih meteoroloških i oceanografskih informacija za jadransko more.

CILJEVI PROJEKTA

Cilj je projekta AdriaClim povećati kapacitet razvoja novih i ažuriranja postojećih planova za prilagodbu klimatskim promjenama na Jadranu. Izradit će se strategije u ublažavanju njihovih učinaka na različita priobalna i morska područja. Poboljšat će se kapaciteti i suradnja na sustavima praćenja i modeliranja klimatskih promjena te će se izraditi napredan informacijski sustav, alati i pokazatelji za optimalno planiranje prilagodbe klimatskim promjenama.

ZAŠTO ADRIACLIM?

Jadranska priobalna i morska područja posebno su osjetljiva na učinke klimatskih promjena.

Prema planu „Piano Nazionale di Adattamento ai Cambiamenti Climatici (PNACC)" (Nacionalni plan za prilagodbu klimatskim promjenama) objavljenom 2017., do 2050. očekuju se sljedeće posljedice klimatskih promjena na jadransko more:

- Porast temperature mora za otprilike 1,5 / 1,6 °C
- Porast razina mora za 7 cm što može dovesti do erozije obale
- Povećan salinitet mora usljed više temperature i volumena
- Učestale pojave salinizacije slatke vode i vodonosnika

ISHODI

U Italiji i Hrvatskoj praćenje, modeliranje i prilagodba u području klime nužni su za suzbijanje štetnih učinaka (ili utjecaja) klimatskih promjena te pretvaranje potencijalnih prijetnji u gospodarske prilike.

Projektom AdriaClim želi se postići sljedeći cilj:

- Razvoj sustava razmjene preciznih informacija koje će ići u prilog razvoju regionalnih i lokalnih planova prilagodbe klimatskim promjenama
- Implementi prilagodbu priobalnog pojasa za održivo plavo gospodarstvo, na temelju pouzdanih i preciznih informacija
- Pridonijeti otklanjanju nedostataka postojećih sustava promatranja te izradom integriranih modela visoke rezolucije unaprijediti i do punih postojeće kapacitete modeliranja
- Usklađeni planiranje mjera za jačanje kapaciteta prilagodbe u Italiji i u Hrvatskoj prekograničnom suradnjom koja će se nastaviti i nakon dovršetka projekta

KLJUČNI PODACI PROJEKTA

TRAJANJE PROJEKTA
01/01/2020 - 31/12/2022

UKUPNI PRORAČUN
8.823.415,00 €

EFRR
7.499.902,75 €

PRISTUP

AdriaClim odgovara na teritorijalne izazove utvrđene jasnim i strukturiranim planom rada, a što će dovesti do rezultata koji su:

integrirani
Klimatski rizici i utjecaji na priobalna i morska područja uključeni su u planirane aktivnosti

osmišljeni
Partnerstvo s vanjskim dionicima

holistički
Rad na poboljšanju sustava klimatskog praćenja i predlaganju rješenja

zemljopisno raspoređeni
Aktivnosti se provode u gotovo svim jadranskim priobalnim regijama

konkretni
Izrada planova prilagodbe klimatskim promjenama za 9 pilot-područja (6 talijanskih i 3 hrvatska)

dostupni
Olakšana razmjena znanja i izgradnja kapaciteta

dugoročni
Uspostava transnacionalnog tijela za stručno upravljanje

komplementarni
Predložene aktivnosti u potpunosti su integrirane

WHO WE ARE

Nineteen partners from Italy and Croatia engaged in finding solutions to the consequences of climate change related to the coastal areas and islands of the Adriatic Sea.

LEAD PARTNER

Arpae - Regional Agency for Prevention, Environment and Energy in Emilia-Romagna

PROJECT PARTNERS

CNR-ISMAR (IT) / ARPA Veneto (IT) / Agency of Development of Zadar County ZADRA NOVA (HR) / Dubrovnik Neretva County (HR) / Ruđer Bošković Institute (HR) / RERA Split – Dalmatia County (HR) / Institute of Oceanography and Fisheries (HR) / Puglia Region (IT) / CMCC Foundation (IT) / University of Bologna (IT) / ARPA FVG (IT) / ISPRA (IT) / Marche Region (IT) / ULSS3 Serenissima (IT) / Molise Region (IT) / Emilia-Romagna Region (IT) / City of Venice (IT) / Region of Istria (HR)

AdriaClim is funded by the Interreg Italy-Croatia Programme.

Interreg is one of the key instruments of the European Union (EU) that supports cross-border cooperation between Italy and Croatia through the financing of joint projects aimed at solving problems through the exchange of knowledge and experiences in all segments and improving the quality of life for more than 12,4 million citizens in that area.

European Regional Development Fund

PROJECT PARTNERS

CONTACT

Regional Agency for Prevention, Environment and Energy in Emilia-Romagna (Arpae)

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Discover more about AdriaClim
www.italy-croatia.eu/adriaclim

AdriaClim

Climate change information, monitoring and management tools for adaptation strategies in Adriatic coastal areas

Protect the coast, adapt to climate change!

European Regional Development Fund

ADRIACLIM

AdriaClim is a new cross-border cooperation project that supports the development of scientific plans to adapt to the consequences of current climate change and the challenges that await us, and to turn potential threats into economic opportunities. AdriaClim will develop regional and local adaptation plans based on up-to-date meteorological and oceanographic information for the Adriatic Sea.

PROJECT OBJECTIVES

The goal of AdriaClim is to increase the capacity to develop new and update existing plans for adaptation to climate change in the Adriatic. Strategies to mitigate its effects on coastal and marine areas at risk will be developed. Capacities and cooperation on climate change monitoring and modeling systems will be improved, and an advanced information system, tools and indicators for optimal climate change adaptation planning will be developed.

WHY ADRIACLIM?

The Adriatic coastal and marine areas are particularly vulnerable to the effects of climate change.

By 2050, according to "Piano Nazionale di Adattamento ai Cambiamenti Climatici (PNACC)" (National Climate Change Adaptation Plan) issued in 2017, the Adriatic Sea is supposed to experience major climate change:

- The temperature of the Adriatic Sea is expected to increase by about **+ 1.5 / 1.6 °C**.
- The sea level in the Adriatic Sea is expected to increase by **7cm possibly leading to coastal erosion.**
- With increasing temperature and volume, **the salinity of the Adriatic Sea is supposed to increase**.
- Fresh water **salinization** and **coastal erosion** are possible.
- Adverse effects on the **marine ecosystem are inevitable**.

OUTPUTS

In Italy and Croatia climate monitoring, modelling and adaptation are necessary to face adverse climate change effects (or impacts) and to turn potential threats into economic opportunities.

AdriaClim aims to achieve the following results:

- Develop accurate information able to support the development of regional and local climate change adaptation plans.
- Plan a coastal adjustment, for a sustainable blue economy, based on reliable and accurate information.
- Contribute to fill the gaps in existing observing systems and enhance and complement the existing modelling capacity by developing high resolution integrated models.
- Consolidate planning of measures for strengthening the adaptation capacity in Italy and in Croatia also building upon cross-border cooperation during and after project completion.

KEY PROJECT NUMBERS

PROJECT DURATION
01/01/2020 - 31/12/2022

TOTAL BUDGET
8.823.415,00 €

ERDF
7.499.902,75 €

APPROACH

AdriaClim addresses the identified territorial challenges by proposing a clear and structured work plan that results in outcomes that are:

integrated

climate risks and impacts on coastal and marine areas are included in the planning of activities

designed

partnership with external actors

holistic

work on improving the climate monitoring system and proposing solutions

geographically distributed

activities are carried out in almost all Adriatic coastal regions

tangible

development of climate adaptation plans for 9 pilot areas (6 Italian and 3 Croatian)

available

facilitated knowledge sharing and capacity building

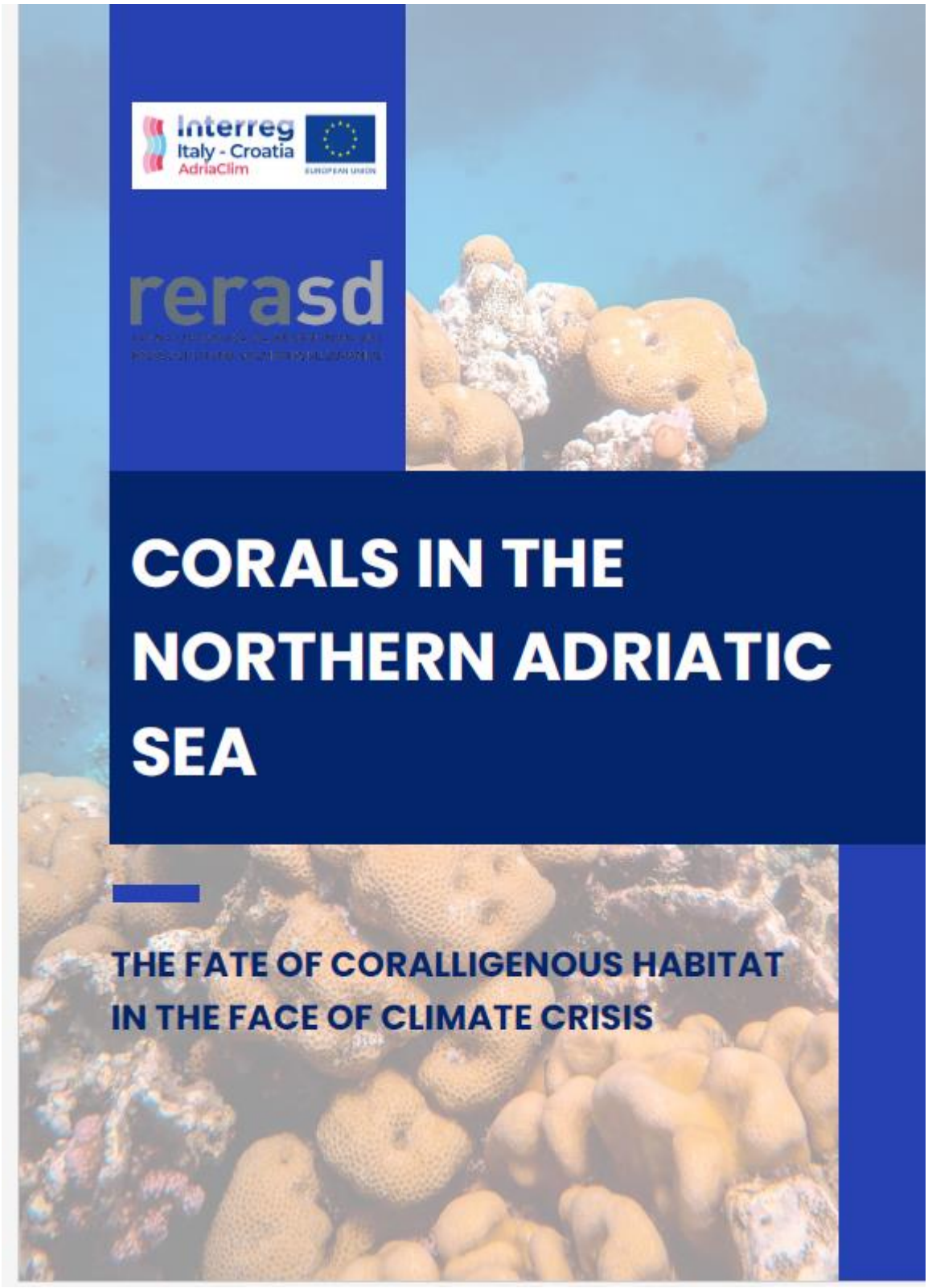
long-term

creation of a Transnational Expert Management Body

complementary

the proposed activities are fully integrated

Text for other materials


Interreg
Italy - Croatia
AdriaClim
EUROPEAN UNION
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CORALS IN THE NORTHERN ADRIATIC SEA
THE FATE OF CORALLIGENOUS HABITAT IN THE FACE OF CLIMATE CRISIS

KEY INFORMATION

Research on the topic of "**Modeling distribution and fate of coralligenous habitat in the Northern Adriatic Sea under a severe climate change scenario**" was conducted by the following scientists and experts: Maria Letizia Vitelletti, Elisabetta Manea, Lucia Bongiorni, Antonio Ricchi, Lorenzo Sangelantoni, and Davide Bonaldo.

The coralligenous habitat is widely distributed in the Northern Adriatic Sea and is known for being an important ecosystem services provider and a hotspot of biodiversity thanks to the many species composing it.

Multiple stressors are threatening the coralligenous presence and its functioning. the effects of climate change are recognized as being among the main hazards affecting it.

the safeguarding of this habitat is considered by two of the main recognized Directives designated for marine environment safeguarding:

- the Habitat Directive (92/43/EEC)
- the Marine Strategy Framework Directive (2008/56/EC)

ABOUT THE STUDY

This study employed Habitat Suitability Models (HSMs) to investigate the distribution of habitats which are known for their capacity in correlating the occurrences of habitats with the environmental patterns characterizing the area of interest.

HSMs are capable to predict the future distribution of habitats under climate change scenarios by employing ocean model simulations. This ability permits to foreseen the potential variation of suitable conditions for the habitat presence in the study area.

This study implemented two of the main known algorithms able to conduct HSMs: **Random Forest** and **MaxEnt.**

Even if differences in the suitability maps emerged, both Random Forest and MaxEnt predicted important variations in the ideal conditions for the presence of the coralligenous under a climate change scenario.

HSMs are useful tools in comprehending the potential evolution of areas if environmental alterations occur and can be employed in marine spatial plans in order to maintain and making coexisting human and environmental needs.

Marine ecosystems have a variety of functions:

- they themselves contain a large portion of the world's biodiversity
- provide many fundamental benefits to humans through resources and activities that they support (such as: fishery, tourism and transportation) which greatly contribute to the whole of the world economy
- they considerably contribute to buffering the effects of climate change and in doing so stabilize the Earth's climate system.

At the same time they have proven to be rather sensitive to matters of climate change and the effects it has on processes that regulate the structure and functions of marine ecosystems such as: oceanographic, biogeochemical, and hydrological. More specifically since the 70s it has influenced or caused:

- abrupt shifts in current climate patterns
- alteration of frequency or intensity of environmental phenomena
- increase in temperatures
- ocean acidification

All of the changes mentioned can contribute to:

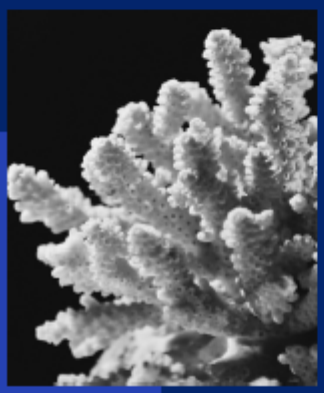
- higher probability and frequency of catastrophic events
- mass mortality
- food webs alteration
- abrupt shifts in the seasonality of ecological processes
- decline in ecosystem diversity and productivity

Furthermore, shifts in marine organism populations, variations in species phenology, and interactions with serious impacts on ecosystem functioning have also been reported as cascade effect of climate change.

This issue has been recognized as a complex and important one, and were first time properly addressed in the Assessment Report (hereby AR) of the Intergovernmental Panel on Climate Change (IPCC) in 2007 (fourth one).

Global warming, as one of the main elements of climate change, and the temperature rise related to it are likely going to result in one of two options: marine species adapting to the new conditions or migrating into suitable ecological niches, causing significant shifts in habitat distributions.

HABITAT SUITABILITY MODELS (HSMS)



Habitat Suitability Models are developed to predict the distribution of habitat in response to a given set of environmental factors, are becoming important tools biodiversity management. Specifically their roles are:

- identifying priority areas of conservation
- assessing the spatial distribution of suitable habitats for a species or a community to live within protected areas
- predicting sites at risk of invasion by exotic species
- investigating the distribution of possible diseases

These models can be grouped in two main categories:

- Mechanistic methods aiming at reproducing the ecological dynamics by explicitly describing (and formalizing into equations to be solved by mean of numerical techniques) their driving processes (e.g. energy fluxes, biological interactions, dispersal);

- Correlative methods aiming instead at reproducing the distribution of species and habitats by addressing their probability of presence (or absence) under prescribed environmental parameters (this method tends to be more efficient in complex systems)

MEDITERRANEAN SEA

Mediterranean Sea, one of the world's biodiversity hotspots, has been predicted to become one of the most impacted by global warming. Many of its species may be negatively impacted by these changes, in particular, the growth and survival of calcifying organisms (corals and coralline algae), are threatened by the alteration of their optimal conditions.

Coralligenous outcrops are scattered on the sandy-muddy seabed of the Northern Adriatic Sea (the northernmost region of the Mediterranean basin) and are locally known as tegnùe, trezze or grèbeni.

They are observed to be associated with methane vents and hypothesized to be cemented by methane seeps mostly originating from microbial decomposition of fossil plant material, a characteristic that makes these outcrops unique in the Mediterranean Sea. They host highly diverse benthic communities, play a fundamental role as reproductive and nursery areas and attract and protect numerous demersal and pelagic fish species.

This habitat is subject to conservation by **two Natura 2000 (N2K)** sites: the **SPA/SAC IT3330009 "Trezze di San Pietro e Bardelli"**; and the **SAC IT3250047 "Tegnùe di Chioggia".** To accomplish the conservation goals set up by global and European strategies (the Convention on Biological Diversity, the European Biodiversity Strategy 2030, the Global Sustainable Development Goals), the N2K network will likely expand in the Adriatic Sea to.

Due to the potential **effects of climatic change** on this habitat, durable conservation efforts in the area and possible designation of new N2K sites, as well as expansion of the network into the Adriatic sea will be needed.

POLICY FRAMEWORK

The coralligenous, is recognized as a priority for conservation under the **Habitats Directive (EU, 1992; 92/43/EEC)** and the **Marine Strategy Framework Directive (EU, 2008; 2008/56/EC)** for its importance as a biodiversity hotspot.

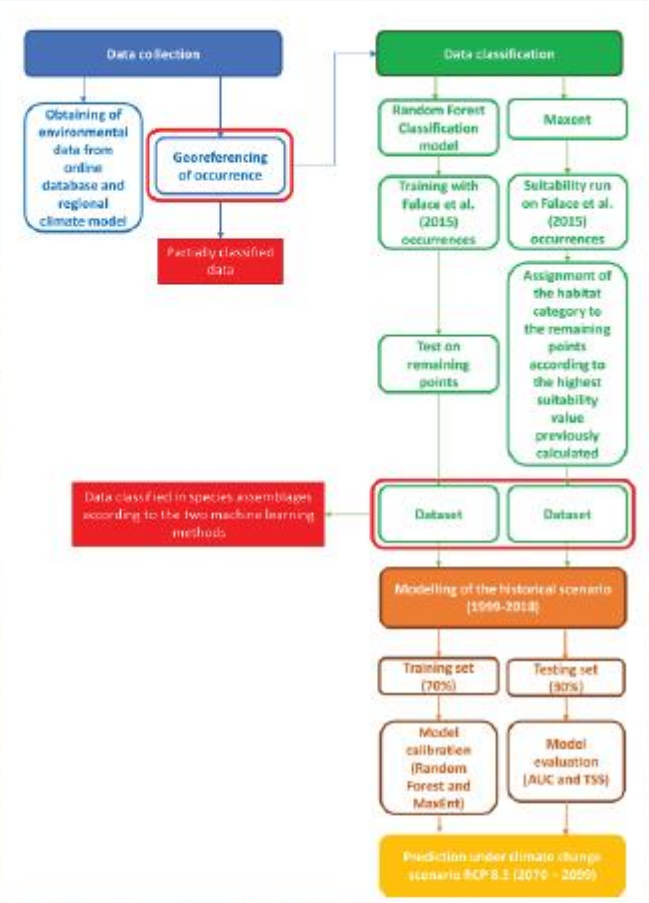
It is the result of a balance between bioconstruction and bioeroding processes carried out by the associated organisms. These complex biogenic structures, characterized by holes and cavities, provide different microhabitats, microenvironments, and ecological gradients that host numerous species, especially coralline algae, mollusks, polychaetes, madrepores, and macroalgae.

Dim-light, narrow thermal oscillations and low water turbidity (influencing the filtering capacity of organisms) are among the main environmental conditions determining coralligenous growth and the number of associated species.

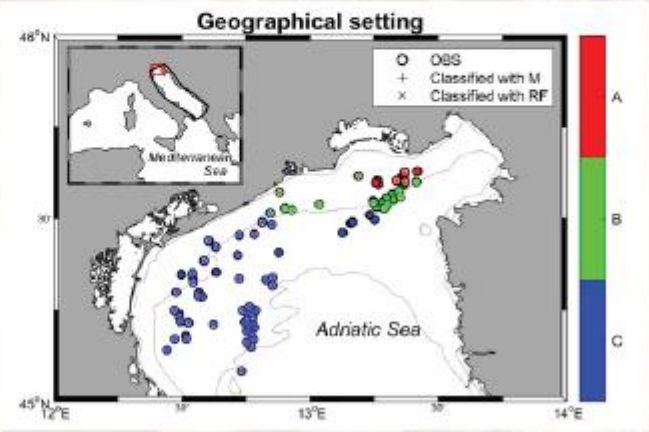
The United Nations has identified this habitat as an ecosystem services provider and has remarked the need for its protection due to its vulnerability to climate change. At the European level, the EU Council (Regulation n°1967/2006) reported guidelines for sustainable fishery practices in the Mediterranean explicitly referring to the need to protect coralligenous habitat.

KEY RESEARCH FIGURES

Workflow of the investigation process

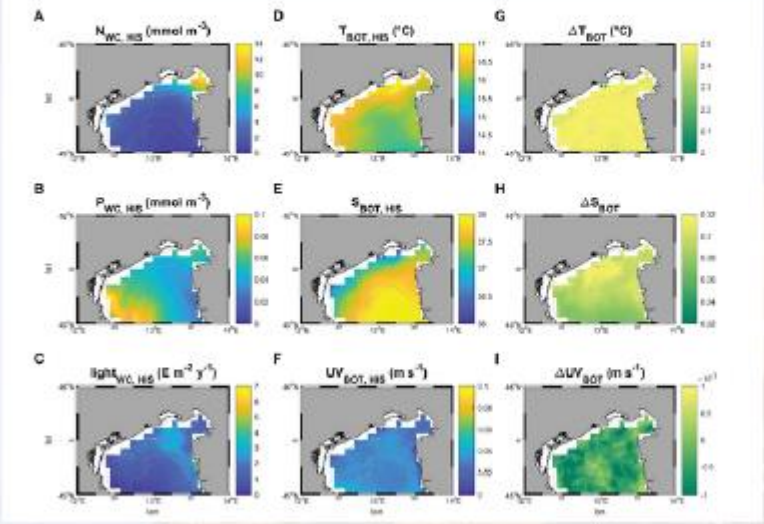


Geographical setting of the are of interest

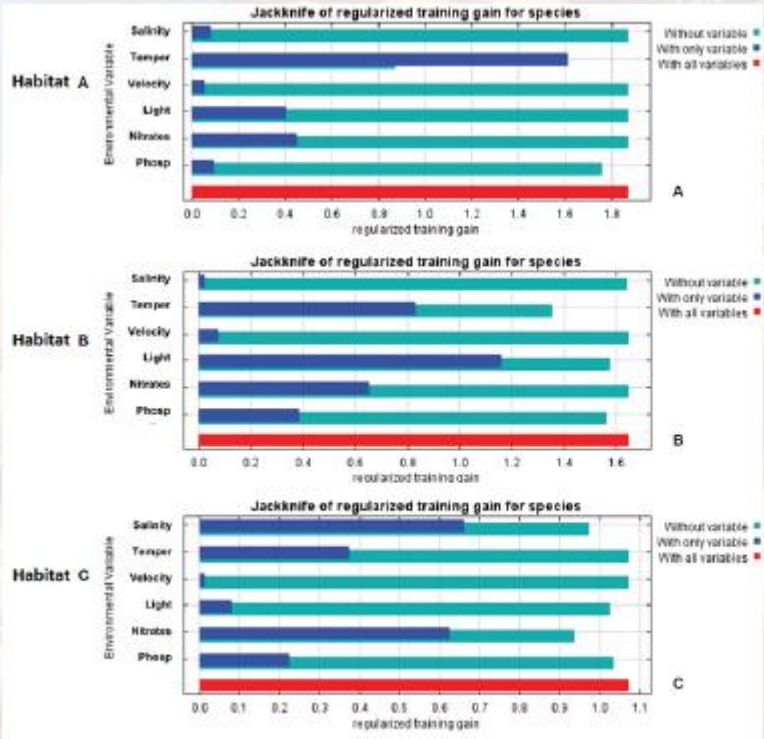


KEY RESEARCH FIGURES

Patterns of the six environmental variables employed in the study



Jackknife analyses results derived from MaxEntr reporting

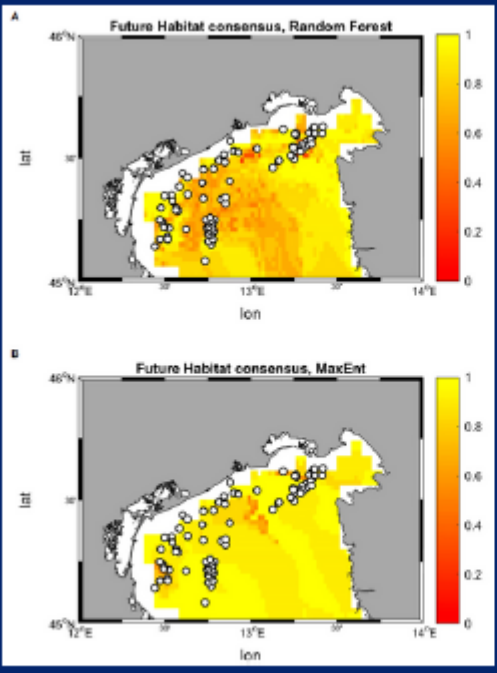


KEY TAKEAWAYS

Through usage of HSMs we achieved a great step in estimation of distributions of potential habitat which allowed for informing conservation strategies. These modeling tools are of great benefit when it comes to supporting planning of environmental surveys as well as the organization of the management itself by suggesting suitable locations for further conservation efforts.

At present neither of the HSM applications proved to be of higher performing value than the other, which suggest that the best strategy for this type of research would be application of different approaches.

Consensus between projected habitat distribution in the sensitivity analysis and the SCE run for Random Forest and Max Ent



Both Random Forest and MaxEnt achieved satisfactory accuracy metrics for the analysis of coralligenous habitats in the Northern Adriatic Sea. However, a tendency of overfitting was reported in the former (together with its higher sensitivity to uncertain input data), which suggests that caution needs to be implemented when interpreting its results.

ABOUT INTERREG ITALY - CROATIA STRATEGIC ADRIACLIM PROJECT

AdriaClim aim is to improve climate resilience in the cooperation area, by increasing the capacity to develop new climate adaptation plans and update existing ones and develop mitigation strategies based on high resolution, more accurate and reliable climate information focussed on the coastal and marine areas (threatened by risks such as sea level rise, sea temperature and salinity anomalies, coastal erosion and salinization of freshwater) and related economic sectors and ecosystem services.

AdriaClim aims at developing an Adriatic scale regional plus local scale for each Pilot integrated information systems composed by hydro-meteo-marine climatological databases (model scenarios and observation) and knowledge-based tools (e.g., indicators) for advanced dynamical implementation of regional climate adaptation plans relevant and accessible for entire the Programme area and Countries.

Additional information and updates on the AdriaClim can be found at **Italy-Croatia AdriaClim**

The entire research can be found at: **Modeling distribution and fate of coriligenous habitat in the Northern Adriatic Sea**

Scenario for video - text

Climate crisis impact on cultural heritage and Adriatic habitats

Time	Text	Description/potential visuals
00:	Aquileia in Friuli-Venezia Giulia region is one of the largest and wealthiest cities of the Early Roman Empire.	Kao naratore staviti dva lika, mladića i djevojku. Ona neka bude znanstvenica, a on primjerice novinar ili student. I neka budu zajedno naratori teksta. A kroz video neka skupa prolaze kroz sve prizore koje ćemo
	Unfortunately, it was destroyed by Attila in the mid-5th century.	
	Most of it still lies unexcavated beneath the fields, and as such it constitutes the greatest archaeological reserve of its kind.	
	The patriarchal basilica, an outstanding building with an exceptional mosaic pavement, played a key role in the evangelization of a large region of central Europe.	
	However, today, Aquileia UNESCO site faces real threats due to climate crisis.	
	The site is affected by weather and climate related impacts, and scientists are investigating the connections between different hazards.	
	From sea lever rise, heavy rains, and ground water level.	
	Most of Aquileia's area is already below sea level.	Tu staviti animaciju potopljenja primjerice čitavog arheološkog nalazišta ili grada za staviti fokus na ozbiljnost klimatskih promjena.

	Embankments prevent lagoon water ingression, and several water pumps keep the area dry.	
	Some water pumps are specifically devoted to protecting some of the deepest archaeological excavations.	
	When heavy rains occur, some parts of the site can be flooded - including the Basilica, especially when at the same time sea storm surges impede pluvial water discharge.	
	Sea level rise will exacerbate these problems, as ground water level will rise too and it will become even more difficult to protect the excavations, the mosaics, the Basilica's bell, and tower's foundations from water related damages.	
	There are also other climate-related impacts such heat waves affecting the archaeologists at the site, tourists or school groups visiting the site.	
	But did you know that cultural heritages under UNESCO protection are not the only thing under severe threat from the climate change?	
	Complexes of shallow wetlands such as the Marano and Grado lagoon are facing significant threats.	
	The Marano and Grado are placed between the Isonzo and Tagliamento river mouths in upper Adriatic Sea.	
	They are extending for about 32 km and reaching up to 5 km width.	

	More than 16,000 are the hectares of canals, tidal flats, saltmarshes, islands, and estuarine areas.	
	The Marano and Grado lagoon is one of the largest and the most characterising Natura 2000 sites of the Friuli Venezia Giulia region.	Tu staviti motive Europske unije odnosno Komisije i drugih tijela kako bi se pratila ideja teksta – EU directive/politike i zaštita okoliša.
	The protected habitats (Directive 92/43/EEC), as Coastal lagoons, Grey and white dunes, Mudflats and sandflats cover about the 85% of the lagoon.	(isto kao scena prije)
	Moreover, other typical transitional habitats, as Mediterranean salt meadows and Seagrass beds are well represented. Estuarine areas, largely present at the mouth of the river Stella, are close to the typically lagoon habitats.	
	Also, did you know that the diversity of habitats is linked with great bird species richness and a diversification in bird communities?	
	Over 300 bird species have been observed, many of which particularly protected.	
	The Marano and Grado lagoon is the most important migrating and wintering area in Italy for the Eurasian curlew, the Grey plover, the Greater scaup, and the Bar-tailed godwit.	
	The lagoon is also frequented by other typical marine animals such as the Loggerhead turtle.	
	Today, the lagoon hosts economic, tourist and industrial services which continue to produce a high degree of anthropisation in the surrounding territories.	

	This is amazing, but I am afraid that these lagoons will face huge problems due to climate crisis?	Tu jedan od naratora (likova) treba reći ovo kao uvod u završnu fazu teksta, a to su posljedice klimatskih promjena.
	Sea level rise is affecting Grado and Marano lagoon in many ways. The physical environment is being transformed and some habitats and species are being reduced and are at risk of disappearing.	
	Sea level rise increases water depth, which in turn accentuates bottom erosion in the lagoon.	
	Consequently, water does not need to flow through tidal channels, preventing them from being filled in by sediments.	
	Silted channels need to be continuously dredged to maintain access for fishermen's boats and in general for navigation in the lagoon, which has always been an important waterway.	
	Increasing salinity is affecting some vegetal and animal species that thrive in less salted waters and that are therefore forced to move or disappear.	
	Apart from sea level rise, also water temperature is rising and this is a problem for organisms adapted to cooler waters;	
	Changes in the lagoon ecosystem and in the trophic chain can also affect productive activities as fishing and extensive aquaculture vallicoltura.	
	Some habitats and species could adapt by moving inland as sea level rises, but that's not	

	possible because the lagoon boundaries have been hardened by embankments.	
	This is a serious problem, and great example of what climate change does to our environment and different habitats.	Ovo govori osoba 1 u videu (student ili novinar)
	We need to tackle the challenges we are facing as soon as possible, and make sure that people are aware of their responsibility to protect our nature, and ecosystem.	Ovo govori osoba 1 u videu (student ili novinar)
	Yes, indeed. You are right. That's why we are here to educate our fellow neighbors, friends, and policymakers to address the biggest threat of our time – climate change.	Ovo govori osoba 2 u videu.