CHANGE WE CARE Final Conference

Final Version of 22/12/2021

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Project Acronym	CHANGE WE CARE
Project ID Number	10043385
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Priority Axis	2
Specific objective	2.1
Work Package Number	2
Work Package Title	Communication activities
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Activity Title	Local, national and international events
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Partners involved	ALL
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Foreword

This document has been produced in the framework of the INTERREG Italy – Croatia CHANGE WE CARE Project. CHANGE WE CARE fosters concerted and coordinated climate adaptation actions at transboundary level, tested in specific and representative pilot sites, exploring climate risks faced by coastal and transitional areas contributing to a better understanding of the impact of climate variability and change on water regimes, salt intrusion, tourism, biodiversity and agro-ecosystems affecting the cooperation area. The main goal of the Project is to deliver integrated, ecosystem-based and shared planning options for different problems related to climate change (CC), together with adaptation measures for vulnerable areas, to decision makers and coastal communities. Additional information and updates on the CHANGE WE CARE can be found at https://www.italy-croatia.eu/web/changewecare.

Executive Summary

On November 11th, 2021, the final conference of CHANGE WE CARE project was held in virtual mode within https://changewecare.evento-digitale.it/ platform from 09:00 to 13:15. About a hundred people, including representatives of Universities, Research Institutes, Agencies, Associations, Public Authorities and related entities, citizens and press, participated in this final event which represented an opportunity for reflection and in-depth analysis of the issues concerning the impacts of climate change on coastal zones in order to identify proper adaptation measures.

Event organisation

The final conference of CHANGE WE CARE project was held on Thursday 11 November, 2021 in online mode following the persistence of the health emergency state due to the COVID pandemic.

The event reminder was sent to the project network and published on social media on the 21st of October.

The communication agency Be-event/Keyin was appointed to support the event organisation following a public procurement procedure. The agency provided the online platform, which was available at the following link: https://changewecare.evento-digitale.it/

The online platform has been customized on the basis of the project brand identity and designed to give attendants an experience as close as possible to an in-presence event, by participating in the sessions and visiting virtual stands which were set up with the information materials (videos, leaflets, agenda of the conference).

Fig. 1 . Virtual Conference hall

The event was advertised on the project website and social media providing information on the conference agenda and the registration procedure. The news was widespread by the Partners as well, though their institutional website and/or social media, and invitations were sent to the project stakeholders via e-mail.

A total of 13 articles were published on websites/online magazines to announce CHANGE WE CARE final conference:

- Novi List (29.10.2021): https://www.novilist.hr/more/projekt-change-we-care-bavi-se-zastitom-obale-hrvatske-i-italije-uskoro-imaju-zavrsnu-konferenciju/
- Informazione.it (06.11.2021): https://www.informazione.it/c/7C9FD052-4A27-4281-9C54-13F309F20EAB/Conferenza-finale-del-progetto-Italia-Croazia-Change-we-Care
- Comunicati stampa (08.11.2021): http://www.comunicati-stampa.net/com/conferenza-finale-del-progetto-italia-croazia-change-we-care.html
- Il giornale dell'ambiente (08.11.2021): https://ilgiornaledellambiente.it/change-we-care-clima-progetto-italia-croazia/
- CNR (08.11.2021): https://www.cnr.it/it/evento/17573/conferenza-finale-progetto-interreg-italy-croatia-change-we-care
- Cnr-Ismar (08.11.2021): http://www.ismar.cnr.it/eventi-e-notizie/eventi/congressi-internazionali/conferenza-finale-progetto-change-we-care
- Parcodeltapo (08.11.2021): http://www.parcodeltapo.it/it/news-dettaglio.php?id=66979
- Parks (08/11/2021): http://www.parks.it/news/dettaglio.php?id=66979
- GreeenplanetNews (08.11.2021): https://www.greenplanetnews.it/change-we-care-conferenza-finale-del-progetto-italia-croazia/
- Il Resto del Carlino (10.11.2021): https://www.ilrestodelcarlino.it/ferrara/cronaca/il-clima-cambia-lanalisi-del-problema-con-gli-esperti-1.7017410
- Unfolding Roma (11.2021): https://www.unfoldingroma.com/eventi-in-citta/16252/conferenza-finale-del-progetto-italia-croazia-%E2%80%9Cchange-we-care%E2%80%9D
- Ispra Ambiente (11/2021): https://www.isprambiente.gov.it/it/news/conferenza-finale-del-progetto-change-we-care
- Oltre le colonne (11.2021): https://www.oltrelecolonne.it/conferenza-finale-del-progetto-italia-croazia-change-we-care/

Running of the event

The conference was held in English language and a simultaneous translation service in Croatian and Italian has been provided.

A total of 114 people attended the conference, 95 were registered on the event platform and 19 were connected using a direct zoom link.

With regards to the registered people, their breakdown in different target groups are shown in Fig. 2

Most of the participants belonged to Universities or Research Institutes (39%), followed by representatives of Local, Regional and National Public Authorities and related entities (32%), general public (12%), Regional and Local Development Agencies, Environmental Agencies, Regional associations (9%) and Press (8%).

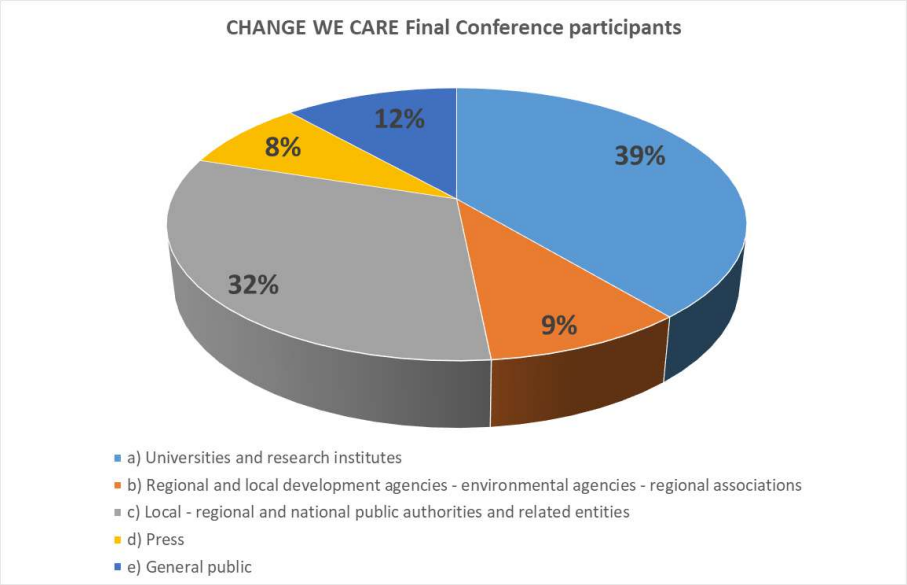


Fig. 2. CHANGE WE CARE final conference attendees.

The meeting started at 09:00 with a welcome greeting and a brief introduction to the agenda by Davide Bonaldo (CNR-ISMAR), CHANGE WE CARE Coordinator.

Diana Gracin Petrović (Project Manager Evaluation and Monitoring Unit - Interreg IT-HR Programme) gave an intervention aimed at presenting the main objectives of the Interreg IT-HA Programme which are to increase the prosperity and the blue growth potential of the cooperation area by stimulating cross-border partnerships able to achieve tangible and concrete changes. She described the priority axes of the programme, the timeline, the budget invested and provided information on the rules for the standard project final reporting. Information about the new programming period 2021-2027 has been released too.

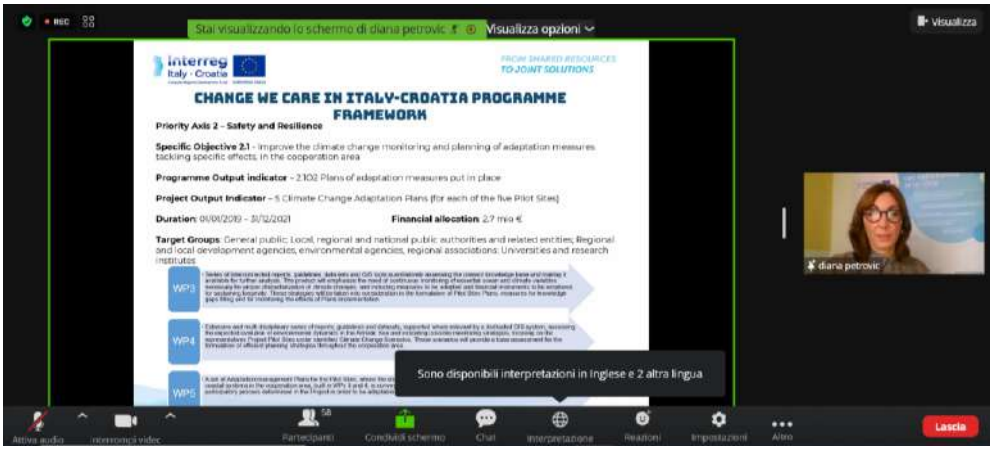


Fig. 3 - Screenshot of Diana Petrović intervention

The first session of the conference “Facing the climate change in coastal areas” was opened with two lectures given by international experts. In particular, Sandro Carniel (Director of the Research Division of the Center for Maritime Research and Experimentation (CMRE) of La Spezia) gave a speech aimed at introducing the issue related to the impact of climate change in coastal areas. He gave an overview on the effects of sea level rise, storms, flooding events and salt intrusion on coastal zones, highlighting their consequences not only on natural resources but also on the economic and social developments of the areas suggesting that coordinated policy responses are needed for climate change adaptation, sustainability, and resilience of coastal zones.

Fig. 4 - Screenshot of Sandro Carniel intervention

The second international expert, Toni Domènech Montaña (Consortium Environmental Policies of Terres de l'Ebre, COPATE Consortium, Spain) illustrated the measures implemented to increase the resilience to climate change in the protected area of Terres de l'Ebre, which is heavily impacted by the effects of climate change such as the decrease of the mean annual river flow, due to both the decrease of rain precipitation and the use for soil irrigation and human consumption. The territory is also suffering forest fires and agricultural activities. Public health is threathened by the proliferation of alien species (snails, mosquitos). Fisheries and aquaculture are affected by the increase in water temperature and change of current and sediment deposition. To face these problems project LIFE CLIONOMICS launched new investment processes for public bodies, especially municipalities, and private subjects in order to reduce the vulnerability of the area, to increase its resilience, improve competitiveness and increase occupation. In the framework of the project a number of adaptation strategies were developed for the agriculture, the forestry, the fishing and the touristic sectors.

Fig. 5 - Screenshot of Toni Domènech Montaña intervention

The second session of the meeting was focused on the outputs of CHANGE WE CARE project. Davide Bonaldo, project coordinator, presented the multidisciplinary approach and the main results obtained in these three years of activity, which provided an assessment of the ongoing processes and the identification of the key drivers of coastal dynamics in five pilot sites as well as the prediction of their evolution in a climate change scenario. Moreover, from a management point of view, the project contributed to the developmentof mitigative and adaptative measures in collaboration with relevant planning authorities and end-users of the pilot sites.

Fig. 6 - Screenshot of Davide Bonaldo intervention

Martina Baučić (University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Croatia) illustrated the adaptation plan developed for the pilot area Jadro River and Kaštela Bay, which is suffering a number of issues related to climate change such as sea level and air temperature rise, heatwave increase, increment of flooding events and water pollution, and appearance of long-lasting dry periods.

The participative process meetings organized with the local stakeholders identified the following measures to increase the resilience of the area: the necessity for one institution to take care of the river Jadro and its basin, the need to control the urbanisation, the development of storm water drainage system with treatment and purification for all the settlement in the basin, the development of new construction specifications and national laws for systems based on "green infrastructures" concept and the implementation of green infrastructures in spatial plans. According to participative process indications, four goals were established for this area: preservation and improvement of water and natural environment, strengthening the resilience of built-up areas to climate change, implementation of smart management of the river and implementation of smart urban management. For each goal a series of measures were identified.

Fig. 7 - Screenshot of Martina Baučić intervention

Norma Fressel (Nature Park Vransko Lake, Croatia) presented the adaptation plan developed for the pilot area of Vransko lake which is impacted by the increase of air temperature and long-term drought periods, intrusion of the seawater with biodiversity loss, increase of eutrophication processes during drought periods and the reduction of water inflows from the basin. The adaptation options emerged from the participatory processes were summarized in five specific objectives aimed to raise awareness and build capacity to adapt and mitigate the effects of climate change, create and strengthening partnerships, preservation of wetland habitats ensuring good water management, implementing pilot actions on carbon farming and flooded meadows restoration, promoting local agricultural products. For each specific objective, activities were identified to increase the resilience of the area to climate change. As an example,

a conceptual solution of regenerative agriculture for adaptation of the effects of different scenarios of climate change in the area of Jansen was illustrated.

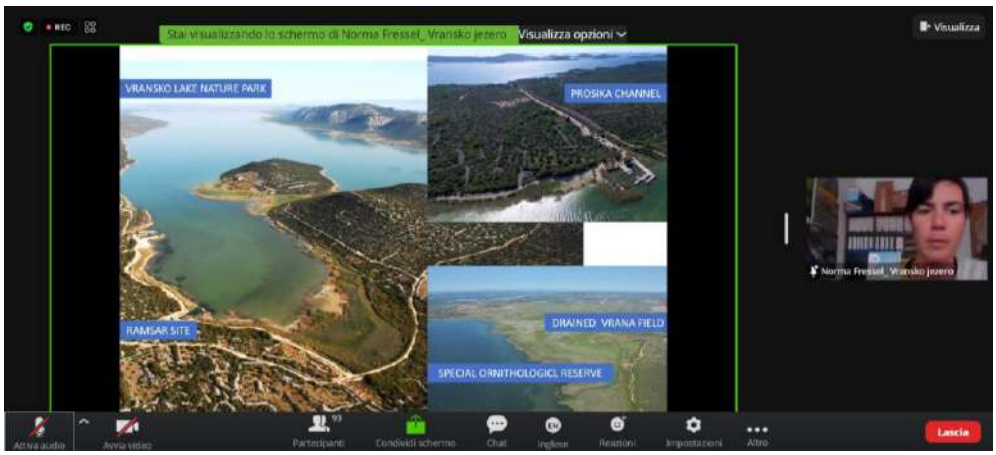


Fig. 8 - Screenshot of Norma Fressel intervention

Paola Marinović (Urbanex, Croatia) presented the adaptation plan developed for Neretva River Delta through the participatory process carried out with local stakeholders. The area is suffering the impact of climate change especially on water resources and biodiversity (sea level increase, salt intrusion, increase of frequency and intensity of floods, loss of endemic species and increase of invasive species), agriculture, fishery and aquaculture activities (change of vegetation period of arable crops, lower yields, migration of marine organisms). The partcipatory process meetings organised with local stakeholders led to the definition of some adaptation measures, which included the need to educate the local population in adapting to climate change, to develop sustainable tourism instead of mass one, to address the problem of adaptation to climate change at an international level, to prevent the construction along the river and to rebuilt marine embankments, to promote organic agriculture andeel hunting only for tourism purposes and to prevent illegal activities. The vision of the “symbiosis of river and people” was also presented, taking into account five goals: preserving ecosystems, improving the sustainable management of aquatic ecosystems, increase the functionality importance of ecosystems, promoting sustainable and resilient economy and population awareness and proactivity.

Fig. 9 - Screeenshot of Paola Marinović intervention

Giuseppe Castaldelli (University of Ferrara) and Marina Aurighi (Veneto Region) presented the activities carried out in the Po Delta (Italy), an area suffering a number of issues related to climate change such as loss of biodiversity, erosion of the barrier island systems, marinization of lagoon and sediment deposition.

Giuseppe Castaldelli illustrated the characteristics of the area with a special focus on the habitat maps of the Emilia Romagna Po Park, in particular those in the Sacca di Goro, stressing the difficulties encountered to use data collected using different sampling protocols. The first phase of activities led to the collection and the standardization of long-term data series on protected species of plants, birds, fish, and clams. Then participatory activities including three workshops with four groups of stakeholders (public entities, tourism and other economic operators, teachers and environmental association, aquaculture producers and fishermen) have been organized, with the aim to identify the prevailing critical issue related to climate change and some concrete actions (projects) to counter and mitigate the effects of climate change. Adaptation measures for the Sacca di Goro include those provided by LIFE Agree project aimed at improving the hydrodynamics of the area, which would lead to benefits for the aquaculture activities as well. Thank the participatory process the consolidation of stakeholder participation in a management model for a protected ecosystem was improved.

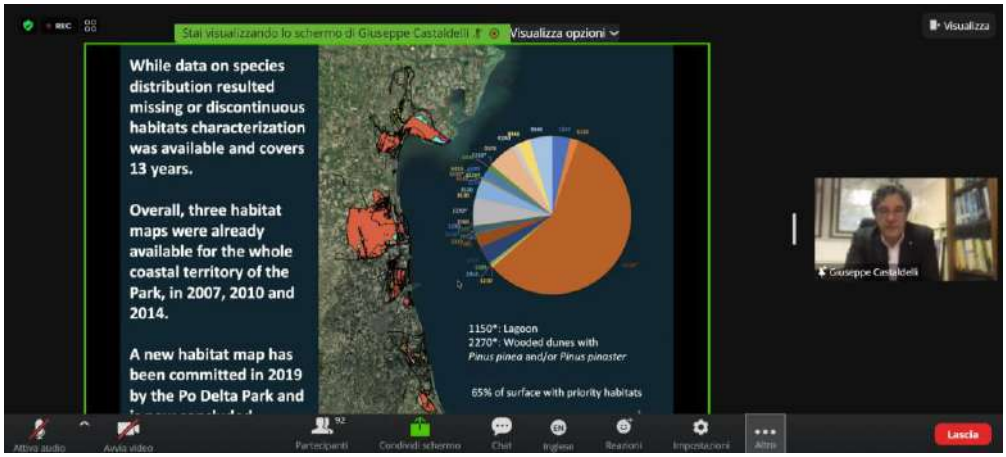


Fig. 10 - Screenshot of Giuseppe Castaldelli intervention

Marina Aurighi (Veneto Region) illustrated the activities carried out in the Po Delta in particular in small area identified by Veneto Region as a focus area for the Project. The evolution of the coastline of Po Delta in the last century as well as the sediment characteristics of the area were described. The analyses of intertidal habitats, aquatic transitional ecosystems and biodiversity mapping indicated that the Po Delta is a vulnerable area, influenced by water and sediment fluxes of the river, which also conveyed pollutants and nutrients. According to modeling activities in the future, the lagoons will vary their ability to maintain internal dynamics and exchanges with the sea. To identify the area at risk a Coastal Vulnerability Index was calculated. The participatory process lead to the identification of the main critical issues of the area, which are the conflict between European fisheries policies and local activities and the conflict between tourist activities and environmental protection requirements. The proposed measures included for greater involvement of residents in choices related to the development of their territory and the organization of training activities.

Fig. 11 - Screenshot of Marina Aurighi intervention

Antonio Bratus (Friuli Venezia Giulia Region) presented the activities carried out in the last pilot site of CHANGE WE CARE project, the Banco della Mula di Muggia, a sandbank very sensitive to sea-level rise and storm patterns for which an adaptive management plan is required for solving the conflicts between tourism activities and protected area saveguarding. After having showed the complex evolution of the sandbank during the last century, which is the result from both natural dynamics combined and important anthropogenic modifications. Project activities were addressed to study sediment dynamics and to formulate short-term and long-term coastal vulnerability scenarios to flooding using modeling. The participatory process organized for the area allowed to collect useful ideas and suggestions from local stakeholders, who recommended to continue monitoring activities, to fix a Rapid Environmental Assessment procedure to be used in case of extreme weather conditions and preserve the morpho-sedimentary system of the bank and the source of the sediments. To preserve the natural habitat and resources it is necessary to regulate kitesurfing activities and strengthening of the defenses in the most vulnerable areas. One of the most important suggestions was regards the overabundant sediments located in specific areas which may be managed as a temporary reservoir for the nourishment of adjacent beaches. Moreover, natural pools and micro-ports could be realized to improve the use of protected beaches close to the sandbank and educative activities.

Fig. 12 - Screenshot of Antonio Bratus intervention

The third session of the event was focused on future perspectives. Mili Novak (RERA SD, Croatia) illustrated the developments of the Joint Action Plan, an initiative launched during the mid-term conference of the project to improve the efficiency and effectiveness of INTERREG Italy-Croatia projects committed to facing the challenges of climatic changes, favoring synergies to meet the priority needs of the two countries. The main objectives of the Joint Action Plan are 1) accelerate climate action and ecological Transformations; 2) reduce duplications and overlapping; 3) increase synergies and improving focusing on priority needs of Italy and Croatia; 4) promoting a favorable environment for climate action. The final goal is to support the Adriatic regions of Italy and Croatia, as well as the Mediterranean ones, towards building resilience and sustainable development. Up to now, ten Interreg Italy – Croatia projects are involved in the initiative, having recognized the need to improve collaboration in data collection, dissemination of results, and exchange of experiences and good practices. The structure of the plan was presented and is structured in a number of categories, to which each project could contribute. The

categories are: Governance, Replications, Monitoring, Methodologies & Tools, Networking and Awareness-raising. For each category the idea to be implemented and the project interested to collaborate were presented. Several priority topics have been identified, including governance/integrated coastal planning, adaptation/mitigation capacity building, green infrastructure/spatial planning, wetlands, marine biodiversity, saltwater intrusion, plastic pollution, microbial contamination, multi-hazard risk management, meteo-marine monitoring, and modeling systems and food/hazard risk map and data.

The identified proposals were:

- Governance - Creation of a hub or meeting place for experts and decision-makers with the aim to facilitate the science-policy dialog needed for taking educated management decisions concerning coastal zone management
- Methodologies and tools - Capitalisation on the tools and methodologies used or developed within the implemented projects to promote or strengthen integrated approaches to the preservation/rehabilitation of the coastal and marine environment and sustainable development of coastal and maritime sectors.
- Replication - Replication of successful examples of adaptation to Climate Change (e.g. Coastal Plan for the Kaštela Bay) by all the regions and municipalities exposed to severe CC impacts, in particular the sea-level rise.
- Networking - Creation of a coordination mechanism that would serve as a hub for all interested partners to communicate their national/regional priorities for funding through EU projects.
- Awareness-raising - Organisation of annual events on the themes related to integrated and coastal zone management and of interactive workshops for target groups on themes of importance for the sea and coast protection and use.
- Monitoring - Monitoring the follow-up of the EU-funded projects i.e. how the actions recommended and approved through these projects are implemented, as one of the criteria for the approval of new projects.

Fig. 13 - Screenshot of Mili Novak intervention

Then, a Panel Session, moderated by Engelbert Ruoss (USI Università della Svizzera Italiana) and attended by Daria Povh (Priority Actions Program / Regional Activity Center (UNEP_PAPRAC), Split, Croatia) and Lorenzo Merotto (Area Marina Protetta Portofino) was aimed at discussing the future challenges and opportunities regarding the implementation of adaptation plans for Adriatic coastal regions. Engelbert Rouss opened the panel session by giving a quick overview of the efforts made in the last 30 years by international organizations such as the UNFCCC to counter the impact of the CC and on the poor results obtained so far. He, therefore, urged the panelists to reflect on what it takes to completely change the direction and the route in the coming years in order to obtain effective results in the fight against climate change. To the question related on what are the needs to face the climate change impacts on Adriatic and Ligurian area and what are the actions taken so far, Daria Povh underlined that for the Croatian Adriatic Region the main impacts of climate change are the increase of flooding and forest fire events, salt intrusion and reduction of the freshwater resource. The actions taken on the ground to face these problems are still not adequate. Only 2 out 7 Croatian Region have already prepared coastal plans and only a few cities have adaptation plans or have implemented green infrastructure solutions. There is a need to enhance governance tools in order to perform a full systemic transition of our society. To do this, it is necessary to built partnerships with all stakeholders by improving their climate literacy. Moreover, it is important to develop spatial planning in the coastal zone to safeguard the key resources of a specific territory.

Lorenzo Merotto illustrated the experience of the Portofino Marine Protected area, where a number of activities are carried out by various stakeholders, causing heavy impacts on marine habitats. In this area, small pilot sites were identified in order to test specific measures, specifically addressed to mitigate and reduce the impacts. To this aim, it was encouraged the involvement of local stakeholders, whose actions could significantly contribute to the improvement of the environmental status of the area.

The session continued discussing the measures which may be put in place to tackle the impacts of climate change. Daria Povh underlined as PAP/RAC established priority policies and strategies for sustainable coastal development based on legal documents and protocols in order to provide a legal background for the actions to be put in place in the Mediterranean area. These documents provides the tools for the preparation of strategies/plans for coastal management. To properly face climate change, the approach has to be focused on priority issues but having a systemic holistic approach.

It has been highlighted how important it is to create a favorable environment for the implementation of the plans by those able to realize the plans, for example Local and Regional Authorities, in order to build partnerships with private and public sectors.

As regards the experience from Portofino Marine protected areas, Lorenzo Merotto underlined as the stakeholder involvement in the small areas such as the Portofino MPA is quite simple. Anyway, the stakeholder involvement process started from the MPA establishment in 1999. In recent years the development of citizen science activities and the involvement process was boosted up. For example, artisanal fishermen and divers now are providing helps to MPA staff with regards to monitoring activities or in the formation of a partnership for project proposals. To engage in climate change a very important instrument is the “vulnerability assessment”, which provides the vulnerability of an area both from an economic and ecological point of view. The vulnerability assessment is a useful tool able to make

stakeholders aware of the future perspectives of the area. Only by understanding the risks associated with climate change which can heavily impact habitats and economic activities, the stakeholders are induced to actively act against the issue.

Engelbert Rouss posed a problematic point regarding the possible opposition of some stakeholders to take part actively in adaptation strategies. In his opinion, people could start to discourage the implementation of these measures because are viewed as a limitation of their economical and social activities.

All the measures to face climate change may have a huge impact on the life quality of millions of people, so the panelists were asked to reflect on the possible solutions able to induce citizens to take action also if it will mean to deeply modify their life style. Daria Povh underlined the fact that our action now will impact the future of our children tomorrow. For this reason, the issue of intergenerational climate justice may guide our choice, because the freedom of one person can be good only if it does not affect the freedom of another. Besides, Lorenzo Merotto asserted that children have to be considered stakeholders according also to sustainable development goals. During activities carried out by the MPA about raising awareness on climate change, often children show a more inclined to change in habits compared to their parents.

Nature should be considered a stakeholder too and we are in charge of taking decisions for both of these categories. Lorenzo Merotto stated that a capital value of nature should be assessed in order to implement more effective actions towards its safeguarding.

The panel session was closed with an intervention of Davide Bonaldo (CNR-ISMAR), who highlighted the role of scientists in bringing the relevance of climate change issues within the political debate and pointed out the importance of projects such as CHANGE WE CARE which put in connection institutions and civil society at different levels to discuss decision making and policy.

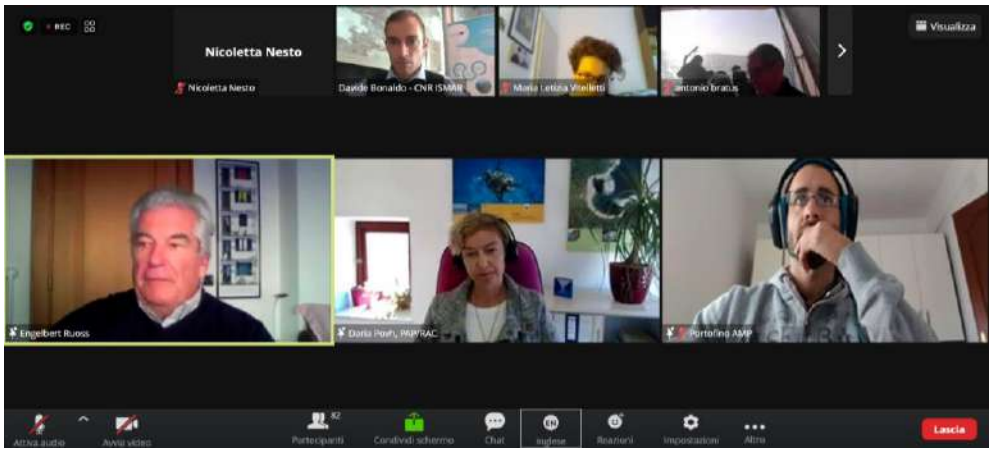


Fig. 14 – Screenshot of the panel session.

The conference has been then closed by the project coordinator, with acknowledgments to the whole project team, to speakers and moderators, being confident that the conference has represented an

opportunity for discussion about different ideas and experiences on how to face the climate change impact on coastal zones, and has contributed to the deepening of these issues, suggesting new opportunities for the design of future shared initiatives.

At the end of the conference, Davide Bonaldo answered the questions of the journalists who had followed the conference, providing further comments on the importance of COP26 also for CHANGE WE CARE project, in order to bridge the gap between scientists, policymakers and citizens, speaking about the necessity to include the environment in financial statements as well as the future collaboration with other projects/initiative aiming to share the experience of CHANGE WE CARE project.

More details on the press conference will be reported in a dedicated report.

On-line coverage of the event

All infos about the conference were published in the project web site and social media. A total of 18 posts on the topic were published in the Italian and Croatian Facebook pages and 7 tweets in the Twitter profile.

The video of the event was uploaded in the YouTube channel of the project and it is available at the following link: https://youtu.be/o1_aCEIS9d0

All Partners gave visibility to the event throught their institutional website and social media and news on the conference were published also in the following external social media:

https://www.facebook.com/greenplanetnews.it/

https://www.facebook.com/green.planner.magazine/

https://www.facebook.com/InEuropa/

https://www.facebook.com/keyInwebagency/

https://www.facebook.com/ebrebiosfera/

@ioPartecipoPlus

@CopateTE

A total of 7 articles were published in on-line magazines to report the main outcomes of CHANGE WE CARE final conference:

1. Novi List (11.11.2021): https://www.novilist.hr/more/change-we-care-bavi-se-zastitom-hrvatske-i-talijanske-obale-od-klimatskih-promjena-evo-sto-predlazu/
2. GreenPlanetNews (12.11.2021): https://www.greenplanetnews.it/change-we-care-il-progetto-interreg-italia-croazia/

3. Eventi culturali Magazine (15.11.2021): https://www.eventiculturalimagazine.com/il-personaggio/davide-bonaldo-occupandosi-ambiente-territorio-aiuta-la-nostra-terra-rifiorire/
4. GreenPlannerMagazine (16.11.2021): https://www.greenplanner.it/2021/11/16/change-we-care-biodiversita-adriatico/
5. IfMagazine (18.11.2021): https://www.lfmagazine.it/latest-news/change-we-care-analisi-riflessioni-quesiti-per-come-affrontare-gli-impatti-del-cambiamento-climatico-sulle-zone-costiere-adriatiche.html
6. Unfolding Roma(19.11.2021): https://www.unfoldingroma.com/cronaca-metropolitana/16293/change-we-care-italia-croazia-unite-nella-salvagiardia-dellambiente/
7. Giornalistinell'erba (19.11.2021): http://www.giornalistinellerba.it/italia-e-croazia-unite-contro-i-cambiamenti-climatici-e-la-perdita-della-biodiversita-in-un-progetto-per-la-salvezza-del-mare-adriatico/

Annexes:

Conference Save the Date

Conference Agenda

Conference Presentations

FINAL CONFERENCE

ANNEXES

CHANGE WE CARE Project Final Conference

SAVE THE DATE!

November 11st, 2021

ON-LINE Event

The conference will present the results of the project sharing with international experts adaptation strategies and measures for increasing resilience to climate change in Adriatic coastal area.

Further information, registration form and meeting agenda will be available soon on the project website and social media.

www.italy-croatia.eu/changewecare

European Regional Development Fund

CHANGE WE CARE

FINAL CONFERENCE

AGENDA

On-line event, November 11st, 2021

AGENDA	
9:00 – 9:10	Participants connection
9:10 – 9:30	Welcome from Authorities *Rosalia Santoleri, Director of CNR-ISMAR, Italy* *Diana Gracin Petrović, Interreg IT-HR Programme*
Session 1. Facing climate change in coastal areas	
9:30 – 9:45	Coastal regions in a changing climate: below the tip of the iceberg *Sandro Carniel, NATO STO CMRE, Italy*
9:45 – 10:00	Promotion of resilience and adaptation to climate change in Terres de l'Ebre *Toni Domènech Montaña, COPATE consortium, Spain*
10:00 – 10:10	Questions & Answers
Session 2. CHANGE WE CARE: from knowledge to adaptation	
10:10 – 10:25	Tackling climate change on the Adriatic coasts: CHANGE WE CARE at a glance *Davide Bonaldo, Project Coordinator, CNR-ISMAR, Italy*
10:25 – 10:35	Break
10:35 – 11:35	Adaptation plan for the pilot area Jadro River and Kastela Bay *Martina Baučić, University of Split, Faculty of civil engineering, architecture and geodesy, Croatia* Vransko lake and climate change adaptation - how to regenerate to adapt? *Norma Fressel, Nature Park Vransko Lake, Croatia* Adaptation plan for Neretva River Delta - participatory process & key conclusions *Paola Marinovic, Urbanex, Croatia* Towards the identification of climate change adaptation options for the Po River Delta *Giuseppe Castaldelli, University of Ferrara, Italy* *Marina Aurighi, Regione Veneto, Italy* Climate change on the Mula di Muggia sandbank: present challenges and adaptation options *Antonio Bratus, Regione Friuli Venezia Giulia, Italy*

Session 3. Future perspectives	
11:35 – 11:55	Development of the Joint Action Plan *Mili Novak, RERA SD, Croatia*
11:55 – 12:25	Panel session: challenges and opportunities in the implementation of adaptation plans *Daria Povh, Priority Actions Programme/Regional Activity Centre (PAP/RAC), Split, Croatia* *Lorenzo Merotto, Area Marina Protetta di Portofino, Italy* *Francesco Musco, Università IUAV di Venezia, Italy* Chaired by *Engelbert Ruoss, Università della Svizzera Italiana, Switzerland*
12:25 – 12:40	Open discussion
12:40 – 12:50	Conclusions and end of works *Davide Bonaldo, CNR-ISMAR, Italy*
12:50 – 13:10	Press Conference

Interreg Italy - Croatia
European Regional Development Fund
EUROPEAN UNION

FROM SHARED RESOURCES
TO JOINT SOLUTIONS

CBC PROGRAMME ITALY-CROATIA
LATEST UPDATES

CHANGE WE CARE Final Conference
11th November 2021

Interreg V-A Italy-Croatia Joint Secretariat

Diana Gracin Petrović, Project Manager
Evaluation and Monitoring Unit

Interreg Italy - Croatia
European Regional Development Fund
EUROPEAN UNION

Italy - Croatia is a Programme that overlooks the Adriatic Sea and is driven by the overall objective aimed at increasing the prosperity and the blue growth potential of the area by stimulating cross-border partnerships able to achieve tangible and concrete changes.

FROM SHARED RESOURCES TO JOINT SOLUTIONS

PROGRAMME IN NUMBERS

12,5 Mio Citizens

2 Member States

88 approved projects*
**83 thematic projects + 5 TA projects*

800 project partnerships
**Data source: keep.eu*

PROGRAMME TIMELINE

2015
In December the EC adopts the Cooperation Programme

2016
The preparation phase is underway and in October is celebrated the launching event

2017
1st Calls for Proposals published

2018
22 "Standard+" project start implementation & 50 "Standard" projects are approved

2019
"Standard+" projects closure.
Launch of the "Strategic Call for Proposals

2020
"Strategic" projects approval.
TF set-up for 21-27 programming period

2021
Ongoing implementation of "Standard" & "Strategic" projects and 3 stakehld. consultations & 9 TF held

2022
Conclusion of implementation of "Strategic" & "Standard" projects implementation

2023
Final reporting: "Strategic" projects and Programme closure

Resticted Call for proposals (CLUSTER Call)

BUDGET INVESTED & MAIN EXPECTED OUTPUTS

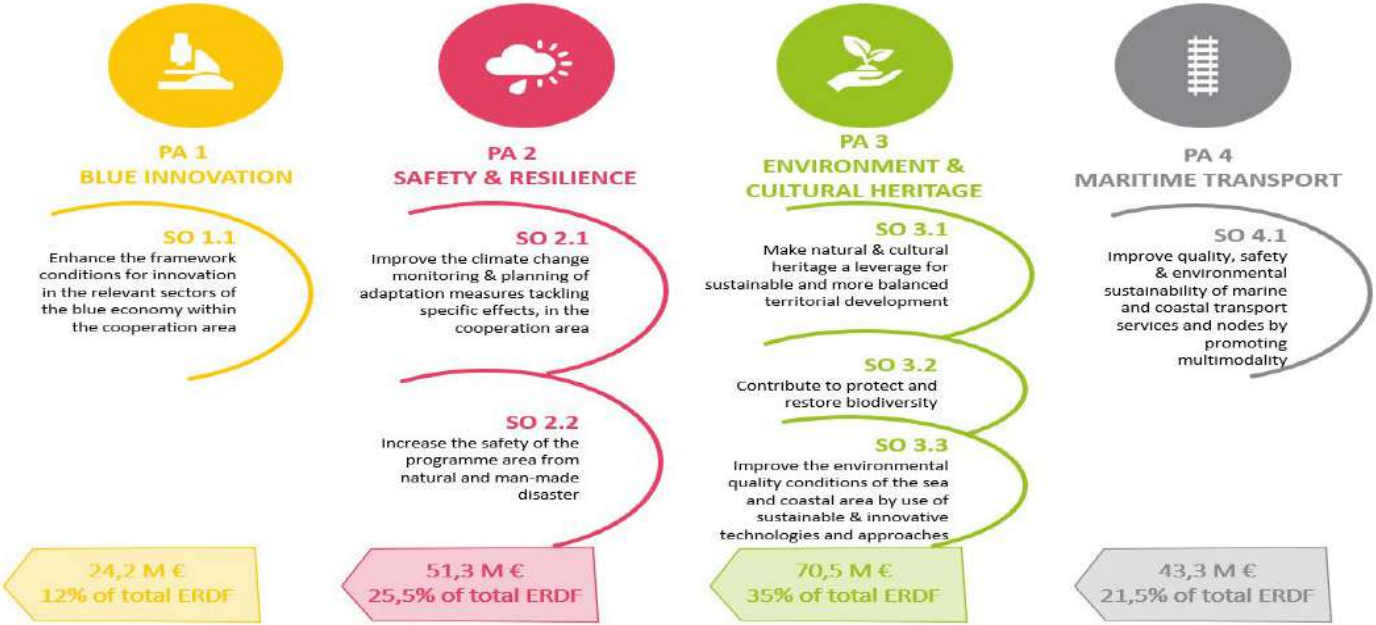
236,9
Mio €

= 2,3 %
OF THE TOTAL EUROPEAN TERRITORIAL COOPERATION BUDGET OF 10,1 BILLION EURO

FOR

- Knowledge and information system
- Policy strategies/action plans
- Technical and professional training
- Pilot projects and demonstration tests
- New services and innovative products
- Strategies and governance tools
- Technology transfer actions
- Development and creation of thematic networks
- Joint technical studies & management plans
- Awareness actions of citizenship

PRIORITY AXIS AND SPECIFIC OBJECTIVES



12 projects

to support innovation and "blue growth"

16 projects

to enhance adaptation measures to climate change and the ability to react to adversity

37 projects

to promote actions related to cultural and environmental heritage and protect biodiversity

18 projects

to strengthen sustainable and intermodal transportation

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KEY OUTPUTS PER EACH PRIORITY AXIS*

**at 31st December 2020 Data source: AIR 2020,*

Table 2: Common and programme specific output indicators - PA 1.1b; PA 2.5a/b; PA 3.6c;/d/f; PA 4.7c

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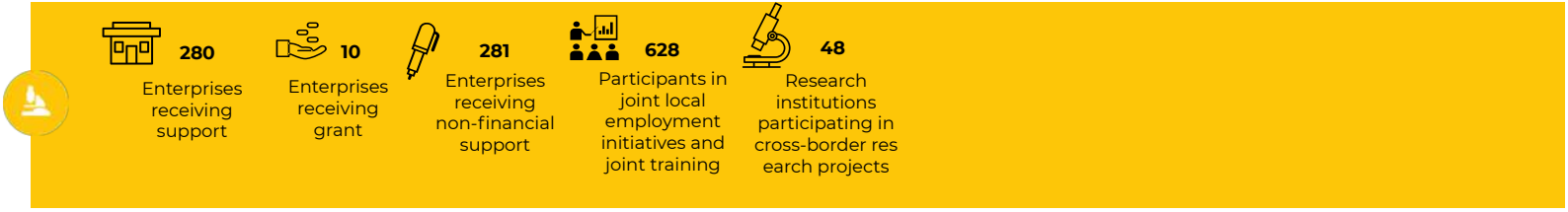

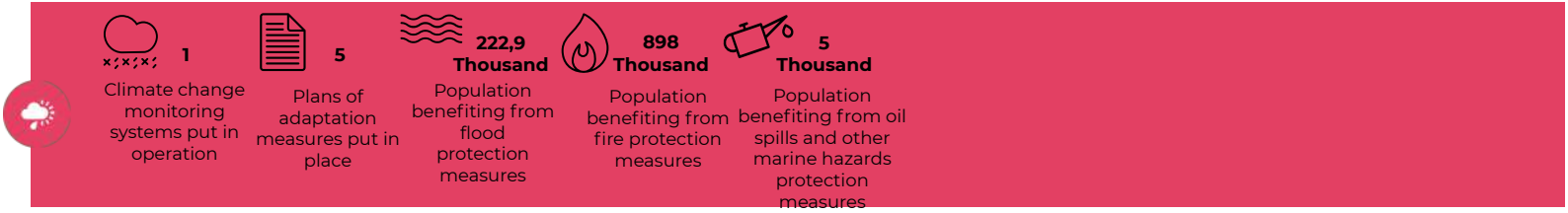

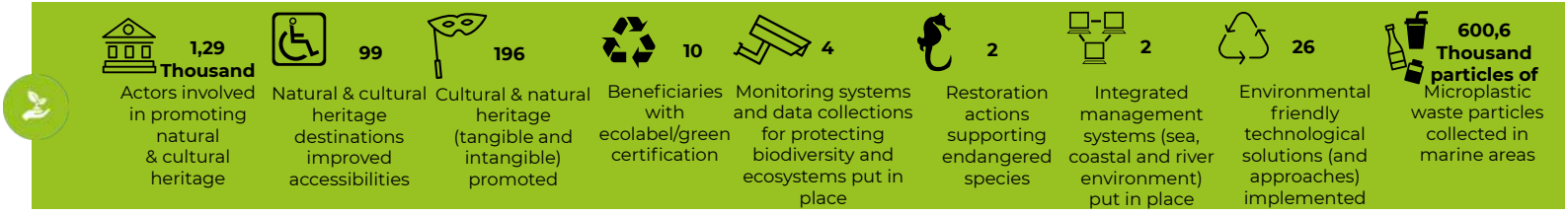

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KEY RESULTS PER EACH PRIORITY AXIS*

**at 31st December 2020*
Data source: AIR 2020,

FROM SHARED RESOURCES TO JOINT SOLUTIONS

Table 1: Result indicators - PA 1.1b.1.1; PA 2.5a.2.1; PA 2.5b.2.2; PA 3.6c.3.1; PA 3.6d.3.2; PA 3.6f.3.3; PA 4.7c.4.1

RESULT INDICATOR	Number of **EPO applications**	Inhabitants benefiting from **planning of adaptation measures**	Inhabitants benefiting from **risk management coordinated measures**	**Seasonality in tourism** in the programme area	Excellent conservation status of **habitat types** and **species of Natura 2000 sites** in the programme area	**Quality level of coastal bathing waters** (according to the dir. 2006/7/CE)	**Goods transported by maritime mode**
BASELINE VALUE (2016)	673,28	7,05 Mio	8,36 Mio	0,62	3538	2,87	2445 Thousand Tons
TARGET VALUE (2023)	680	8 Mio	9 Mio	0,62	3550	2,87	2690 Thousand Tons
TOTAL (2020)	**997**	**12,23 Mio**	**11,72 Mio**	**0,72**	**3576**	**2,93**	**2306 Thousand Tons**

CHANGE WE CARE IN ITALY-CROATIA PROGRAMME FRAMEWORK

Priority Axis 2 – Safety and Resilience

Specific Objective 2.1 - Improve the climate change monitoring and planning of adaptation measures tackling specific effects, in the cooperation area

Programme Output indicator – 2.102 Plans of adaptation measures put in place

Project Output Indicator – 5 Climate Change Adaptation Plans (for each of the five Pilot Sites)

Duration: 01/01/2019 – 31/12/2021

Financial allocation: 2.7 mio €

Target Groups: General public; Local, regional and national public authorities and related entities; Regional and local development agencies, environmental agencies, regional associations; Universities and research institutes

WP3

- Series of interconnected reports, guidelines, data sets and GIS tools quantitatively assessing the present knowledge base and making it available for further analysis. The product will emphasize the need of continuous monitoring of essential ocean and climate variables necessary for proper characterization of climate changes, and including measures to be adopted and financial instruments to be employed for sustaining longevity. These strategies will be taken into consideration in the formulation of Pilot Sites Plans, measures for knowledge gaps filling and for monitoring the effects of Plans implementation

WP4

- Extensive and multi-disciplinary series of reports, guidelines and datasets, supported where relevant by a dedicated GIS system, assessing the expected evolution of environmental dynamics in the Adriatic Sea and indicating possible monitoring strategies, focusing on the representatives Project Pilot Sites under identified Climate Change Scenarios. These scenarios will provide a base assessment for the formulation of efficient planning strategies throughout the cooperation area.

WP5

- A set of Adaptation/management Plans for the Pilot Sites, where the shared knowledge base on the present and expected dynamics of coastal systems in the cooperation area, built in WPs 3 and 4, is conveyed. The definition of such Plans will be pursued by means of a participatory process determined in the Project in order to be adaptable in different natural and anthropic conditions.

STANDARD PROJECTS FINAL REPORTING

FACTSHEET n.7 PROJECT CLOSURE

Version of 23 August 2021

Contents

INTRODUCTION

1. PROJECT CLOSURE PROCESS

1.1. Project Closure Costs

1.2.Last Progress Report

1.3. Last Application for Reimbursement

1.4. Formal Letter Confirming the Closure of the Project

2. LEGAL REQUIREMENTS TO CONSIDER AFTER PROJECT CLOSURE

2.1. Ensuring the Trail and Keeping the Records

2.2. Revenues Generated after the End of the Project

2.3. Investments in Infrastructure or Productive Investments

2.4. Rules Concerning Information and Communication

2.5. Project website and digital tools

2.6. Formalities required under the applicable State Aid rules in force

3. CONTROLS AFTER PROJECT CLOSURE

WHERE TO FIND ASSISTANCE

ANNEX I

Final PR due on 31st March 2022 (SIU confirmation)

↓

JS check – requests for clarifications

↓

Once the PR is validated by JS, the LP submits the PR

↓

Application for Final Reimbursement

CLUSTERS CALL FOR PROPOSALS

Maximize the experiences of the IT-HR Standard+ and Standard Projects

Fully exploit and consolidate the results achieved so far

Increase the knowledge base on the addressed topics in preparation for the next programming period

Allow synergies between projects to enhance visibility and transferability

IT-HR CLUSTER n. 1: Connectivity from the sea: data driven solution in the sea economy

IT-HR CLUSTER n. 2: Adaptation to climate changes: governance and capacity building

IT-HR CLUSTER n. 3: Joint development of thematic cultural routes

IT-HR CLUSTER n. 4: Marine monitoring as a tool in Maritime Spatial Planning (MSP)

IT-HR CLUSTER n. 5: Improving quality, efficiency and environmental performance of Adriatic ports

CLUSTERS CALL FOR PROPOSALS

INFOSESSION held on 9th November

ELIGIBILITY: LP or PP of one of the **Standard+ or Standard** projects
In CLUSTER n. 2: Adaptation to climate changes: governance and capacity building:

- ✔ ADRIADAPT
- ✔ ASTERIS
- ✔ CHANGE WE CARE
- ✔ iDEAL
- ✔ Joint_SECAP
- ✔ MoST
- ✔ READINESS
- ✔ RESPONSE

TIMEFRAME OF THE CfP

NEW PROGRAMMING PERIOD 2021-2027

2 working group meetings held on the new programming and for the establishment of the Task Force

9 Task Force meetings held for the preparation of the new programming

2 local consultation webinars held (April) and 1 CBC stakeholders consultation (October)

Territorial and socio-economic analysis

Final draft of Chapter 1 of the IP(Definition of the Intervention Logic, Priorities, Specific Objectives, Actions)

Drafting of Chapter 2 (Indicators methodology, Target groups, Communication strategies

Discussion to decide on different strategic items (e.g. small projects, ISO 1, SCOs, Operations of strategic importance)

Strategic Environmental Assessment (SEA) – scoping launched, environmental report, consultations, decision making)

Public consultations

Definition of the Financial Plan, appointment of the Programme authorities

Signing of the agreements between participating MS

Submission to the EC

To do

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TO JOINT SOLUTIONS

INTERREG ITALY-CROATIA 2021-2027

PO 2 A greener, low-carbon transitioning towards a net zero carbon economy and resilient Europe **mandatory for CBC Programmes**

SO 2.4 Promoting climate change adaptation and disaster risk prevention, resilience, taking into account eco-system based approaches SO 2.iv

Focus of CB cooperation

- Joint knowledge development and planning, including joint monitoring, forecasts, alignment of climate change adaptation strategies
- Prevention, including joint management of cross-border forests, rivers, coastal zones, joint awareness raising campaigns
- Preparedness, including cross-border early warning systems, interoperability of civil protection units, facilitation of sharing of assets
- Disaster risk management planning: Member States need to report on “priority prevention and preparedness measures” for “key risks having cross-border impacts” (Union Civil Protection Mechanism Decision, Art. 6)

Managing Authority
Veneto Region

Dorsoduro 3494/A,30123
Venezia (Italy)
+39 041 279 1781
italia.croazia@regione.veneto.it

Joint Secretariat
Head Quarter

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Joint Secretariat
Branch office
Zadar

Franka Lisice 77,
23000 Zadar - Croatia
+385 23 316 336
js.it-hr.branch-offices@mrrfeu.hr

Coastal regions in a changing climate: a security perspective

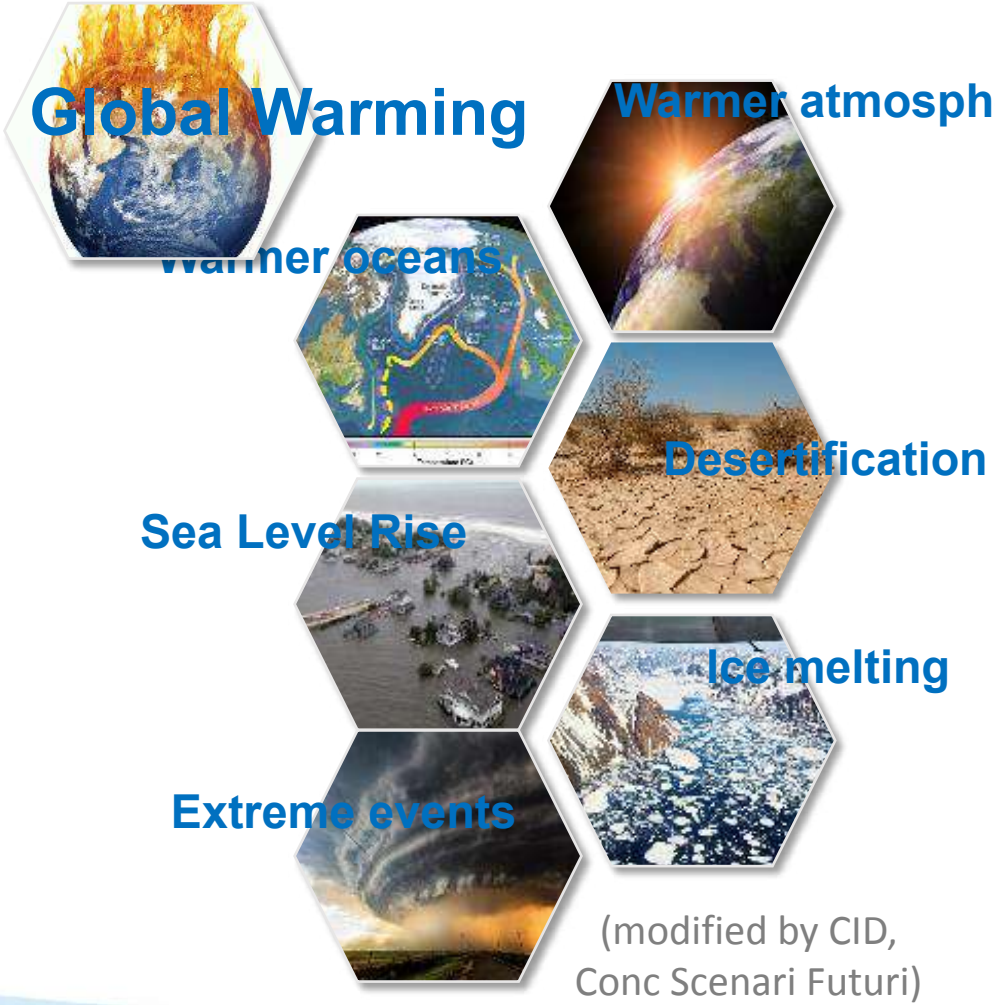
CHANGE WE CARE | NATO STO CMRE| Dr Sandro Carniel

Final Conference | On-line| November 11th, 2021.

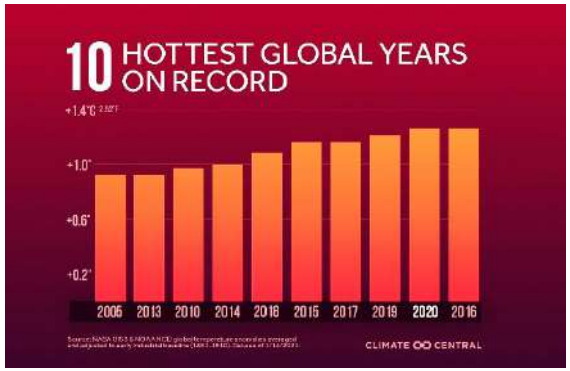
Outline

- Climate change and changing oceans: effects and consequences
- A security perspective on climate change
- Focus on coastal regions
  - Sea Level Rise
  - Coastal cities and migrations
  - Costal infrastructures and ports
  - Transportation and traffic
  - Supply chain
- Conclusions

Climate change and changing oceans

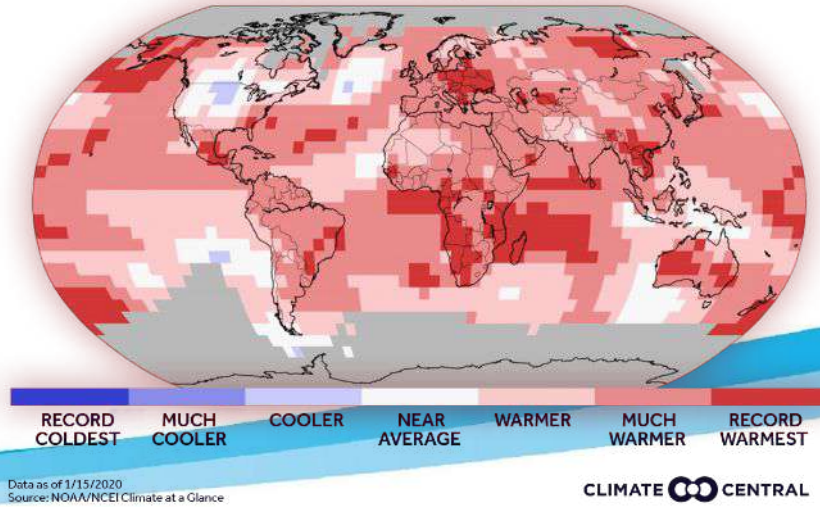


(modified by CID, Conc Scenari Futuri)



Global average temperature trend and picks

2019 Global Land and Ocean temperatures



(© CLIMATE CENTRAL)

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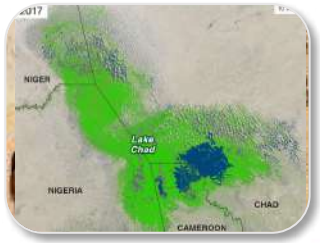
Climate Change Impact on Ecosystem Services

Environmental modifications cause the contraction, loss or displacement of ecosystem services
Affecting productivity, purification, bio-sanitary, local climate regulation services, with direct effects on empowerment and migrations



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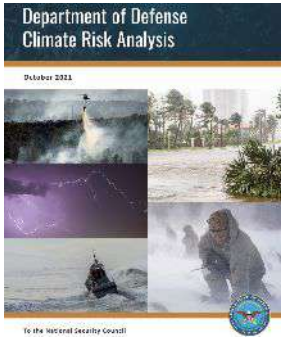
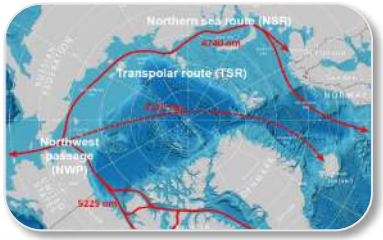
Climate security

- New seaways and shipping routes
- New frontiers of geostrategic competition
- Endangered coastal infrastructures and human settlements
- Global supply chain put at risk
- Impact on fisheries, shifts in agricultural production, food shortage
- Increase global food prices and competition over scarce resources
- Increased regional tension and instability
- Increased climatic migrations (est. 86 milion from Africa before 2050)
- Modified distribution and range of vector-borne diseases, pandemics
- Reduced readiness and underimined resilience



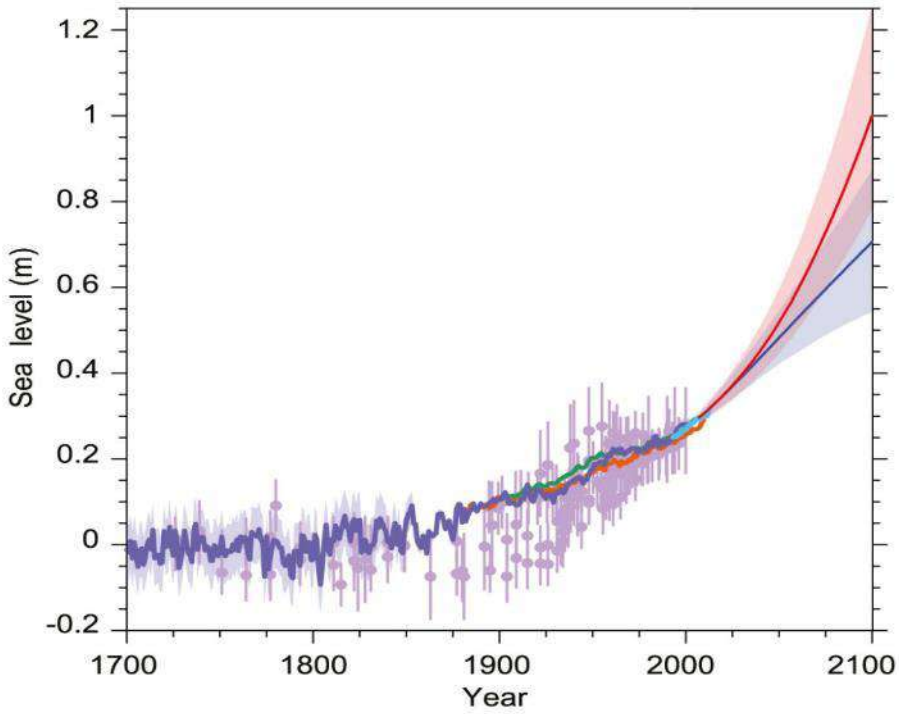


(modified by CID, Conc Scenari Futuri)

What are the expected scenarios for costal regions?

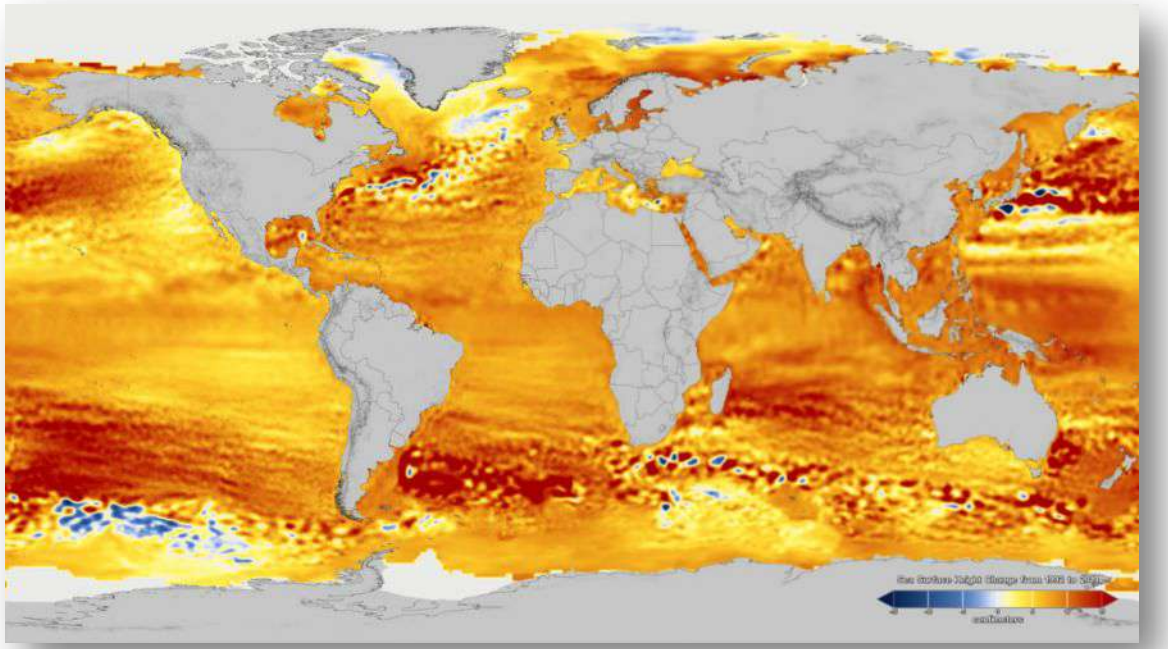
https://www.shutterstock.com/image-photo/statue-liberty-sinks-ocean-1473010394

Sea Level Rise as effect of a warmer Ocean



The Global Mean Sea Level is rising and accelerating its pace

+1.3 mm/year (1901-1971)
+1.7 mm/yr (1997-2010)
+3.2 mm/yr (1993-2010)
+3.7 mm/yr (2006-2018)



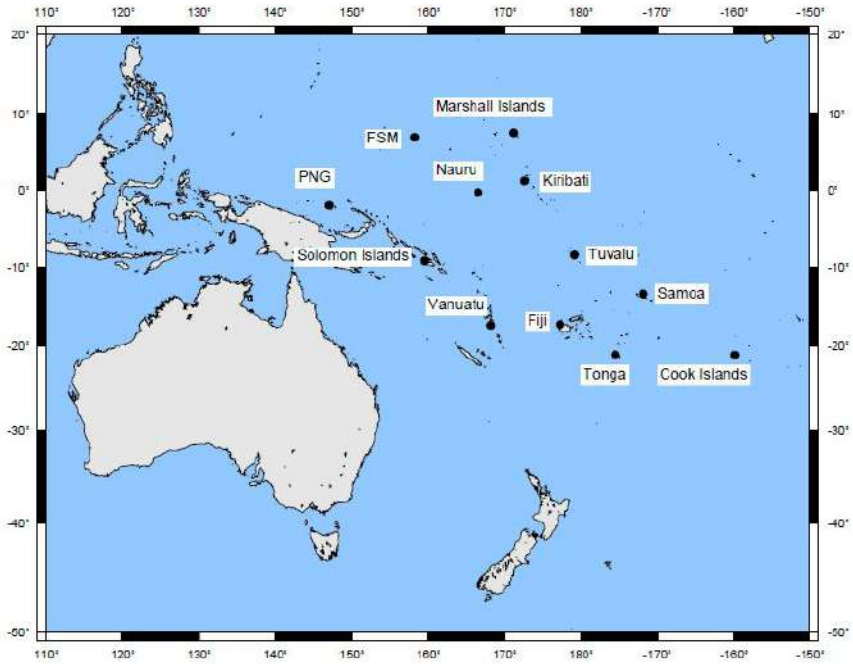
Change in sea surface height across the globe from 1993 to 2019 measured by satellite altimeters

(NASA)

(IPCC ,ch 13. NASA)

Disappearing islands as effect of SLR

Figure 1. Pacific Sea Level Monitoring Network of SEAFRAME stations



At least eleven Solomon Islands have either totally disappeared or are experiencing severe erosion

Marshall islands and Micronesia

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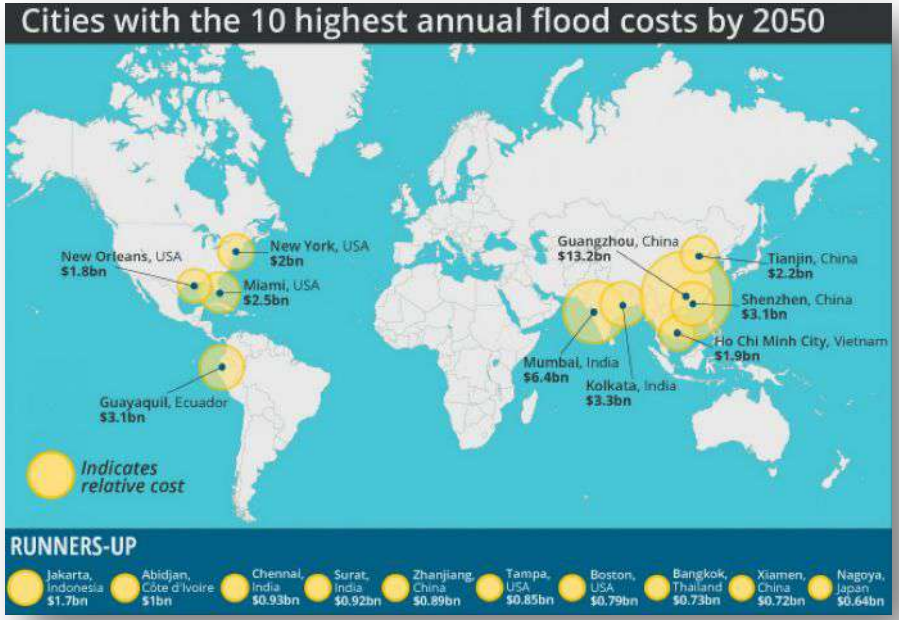
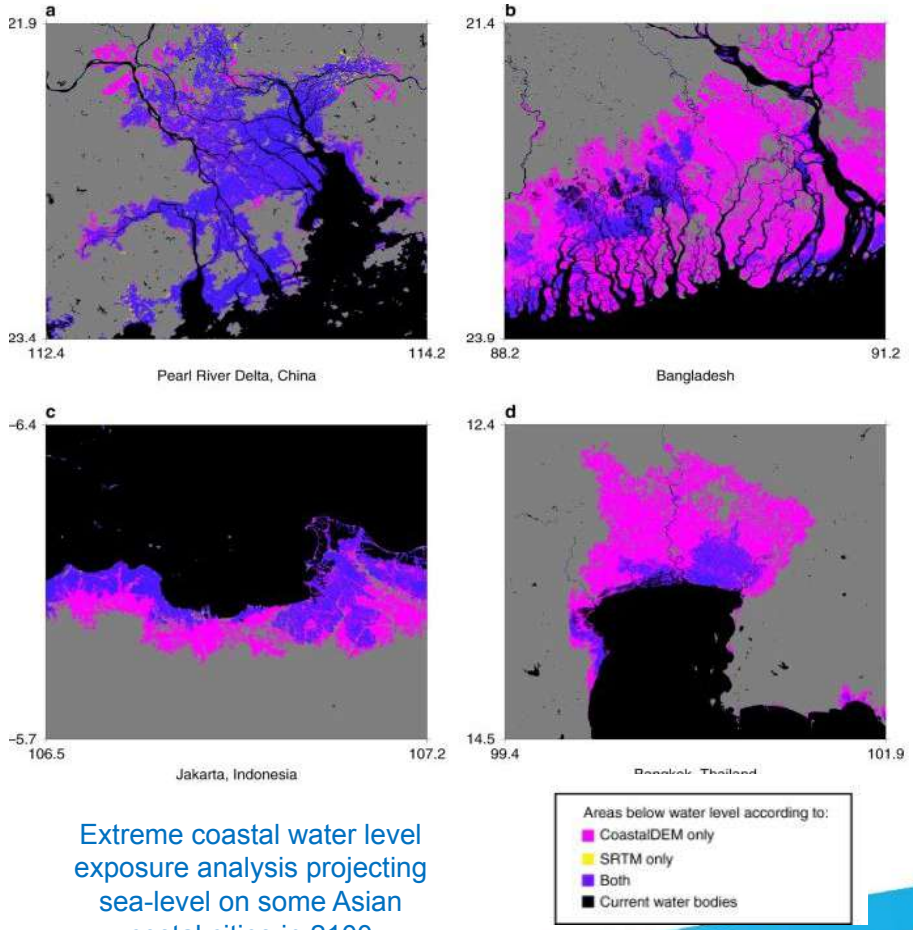
SLR impact on coastal cities

250 M people live on land below projected annual floods level (projection: 340 M in 2050, 630 M in 2100)

Currently, **1 billion** people occupy land less than 10 m above current high tide lines, 230 M below 1 m



In 2050, 66% of world population is expected to live in big cities



Extreme coastal water level exposure analysis projecting sea-level on some Asian costal cities in 2100

(Kulp & Strauss, 2019, CostalDEM)

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Effects of extreme events on coasts

- Increased intensity of storm surge and heavy precipitation
- Flood low-lying areas, damage properties, destroy habitat, and threaten human health and safety
- Disrupt infrastructures and transportation systems
- Impact on sea shipping infrastructure and global supply chain

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Conclusion

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Thank you

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Promotion of resilience and adaptation to climate change in Terres de l'Ebre

CHANGE WE CARE | COPATE | Antoni Domènech

Final Conference | On-line| November 11th, 2021.

European Regional Development Fund

Consortium of Environmental Policies of Terres de l'Ebre

COPATE

Consell Comarcal del Baix Ebre
Consell Comarcal de la Terra Alta
Consell Comarcal del Montsià
Consell Comarcal Ribera d'Ebre

- Public health *(pest treatments)*
- Waste Mangement
- **Biosphere Reserve** *(2013 – present)*
  - Management Plan (MP)
  - Projects aligned to the MP
- Habitat Management
- Technical Services
  - Sewage treatment
  - Energy efficiency

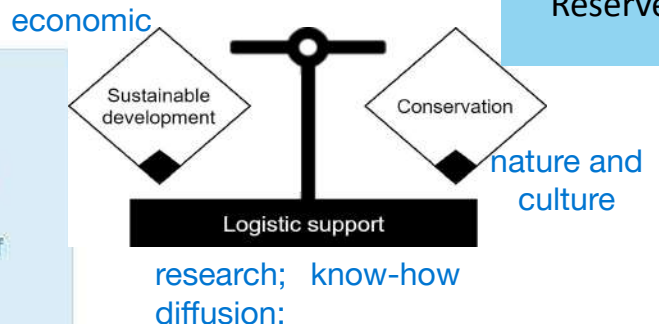
CONTENT OF THE PRESENTATION

1. Terres de l'Ebre Biosphere Reserve
   - *Territorial context and governance model*
2. The challenges induced by Climate Change
   - *Terres de l'Ebre, the most vulnerable area of Catalonia to climate change*
3. Promoting resilience and adaptation to climate change
   - *Life Clinomics project*

WHAT ARE BIOSPHERE RESERVES?

1

Terres de l'Ebre Biosphere Reserve



Core Areas

It comprises a strictly protected zone that contributes to the conservation of landscapes, ecosystems, species and genetic variation.

Buffer Zones

It surrounds or adjoins the core area(s), and is used for activities compatible with sound ecological practices that can reinforce scientific research, monitoring, training and education.

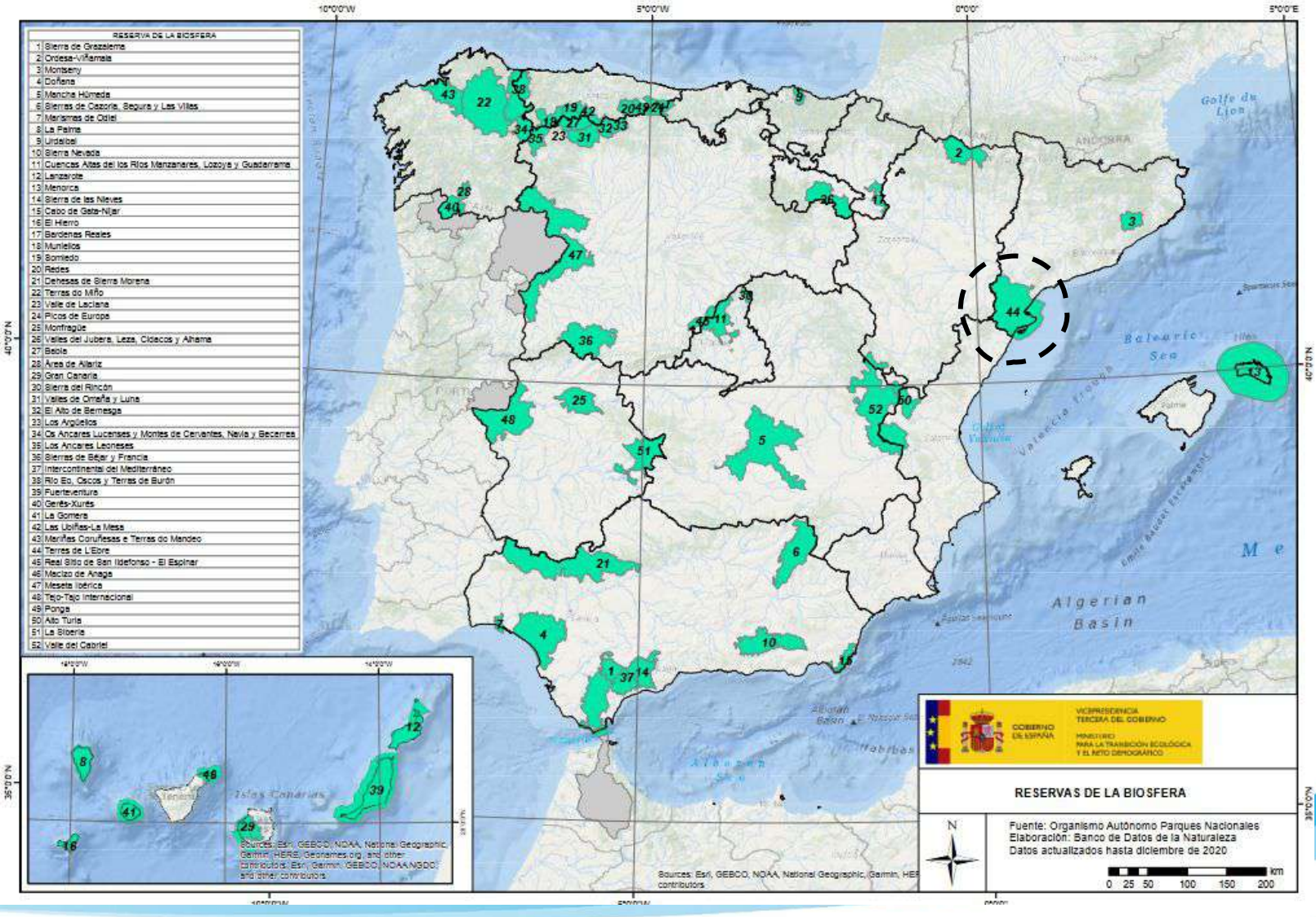
Transition Area

The transition area is where communities foster socio-culturally and ecologically sustainable economic and human activities.

BIOSPHERE RESERVES IN SPAIN

1

Terres de l'Ebre Biosphere Reserve



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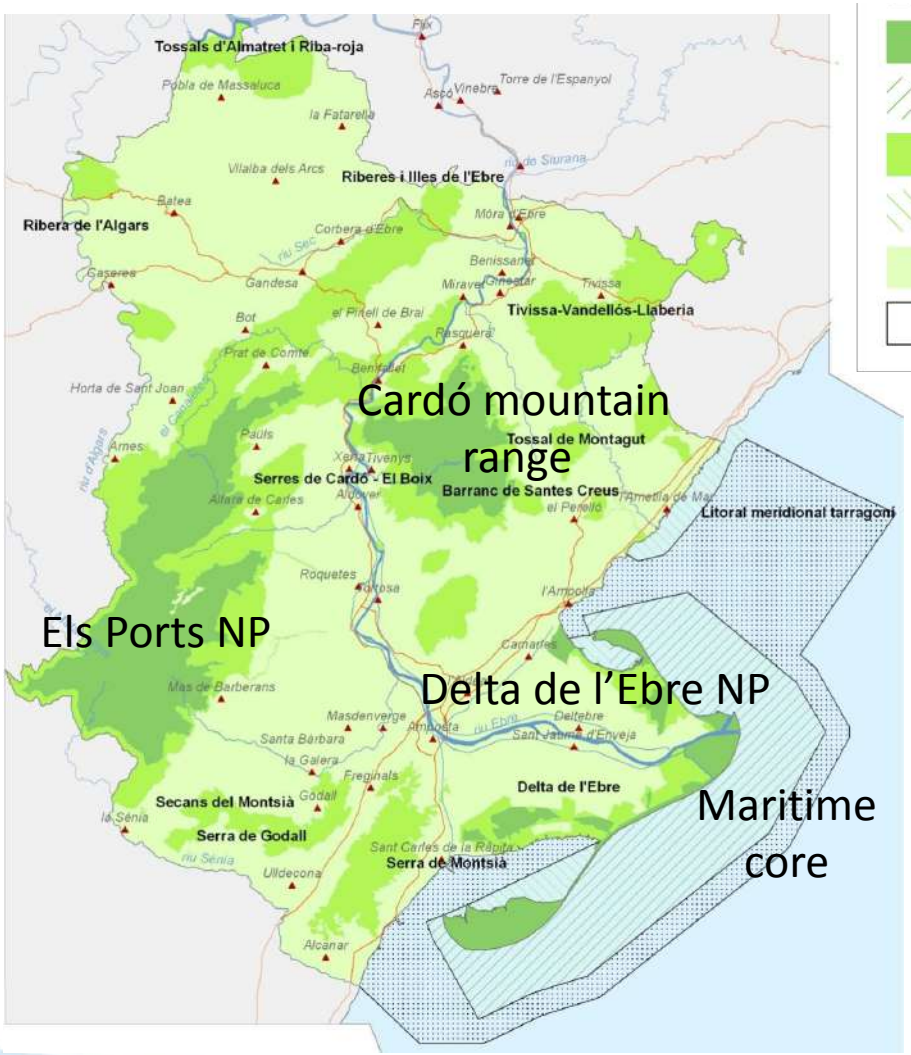
Terres de l'Ebre · RESERVA DE LA BIOSFERA

ZONING

1 Terres de l'Ebre Biosphere Reserve



- Core area (Continental)
- Core area (Maritime)
- Buffer area (Continental)
- Buffer area (Maritime)
- Transition area (Continental)
- Transition area (Maritime)

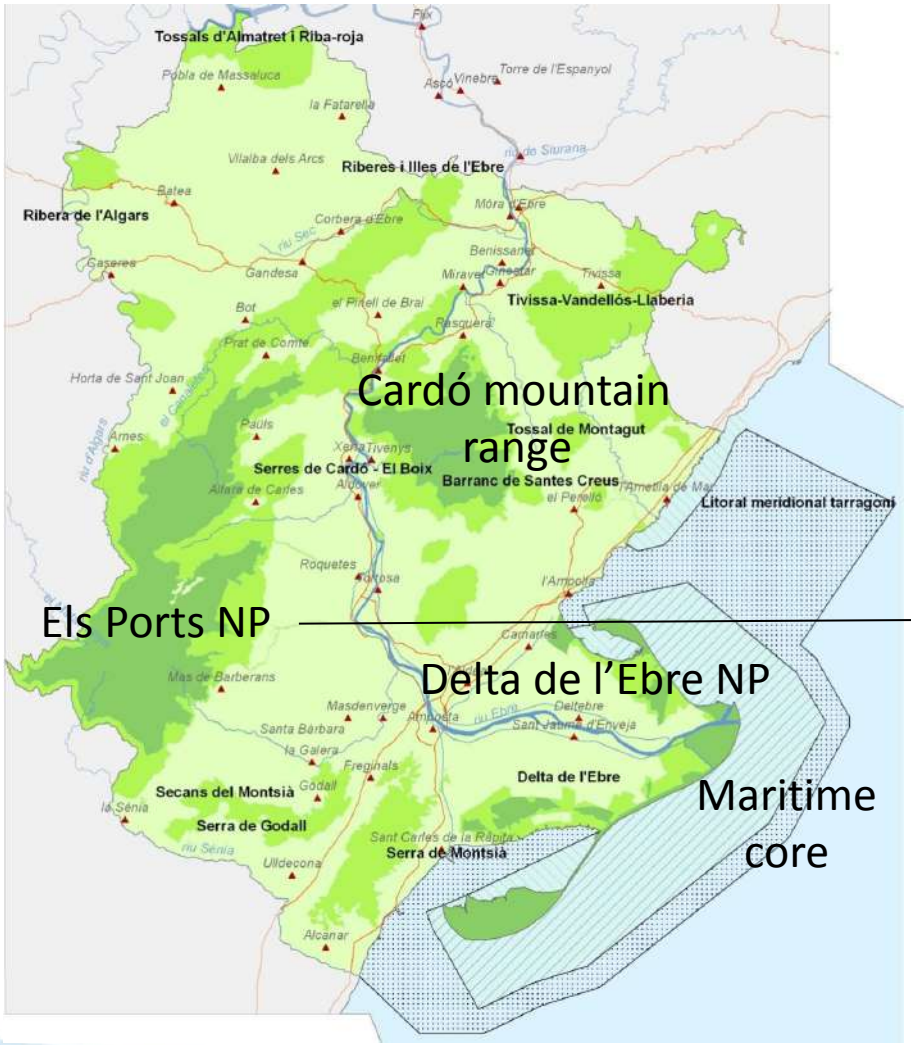
Core area: 71.697 ha. (19,5%)
Buffer area: 74.780 ha. (20,3%)
Transition: 221.250 ha. (62,1%)

Population: 182.521 inhabitants
Administrative division: 45 municipalities belonging to 4 counties (Baix Ebre, Montsià, Terra Alta and Ribera d'Ebre).

CORE AREAS

1

Terres de l'Ebre Biosphere Reserve



Source: Patronat de Turisme

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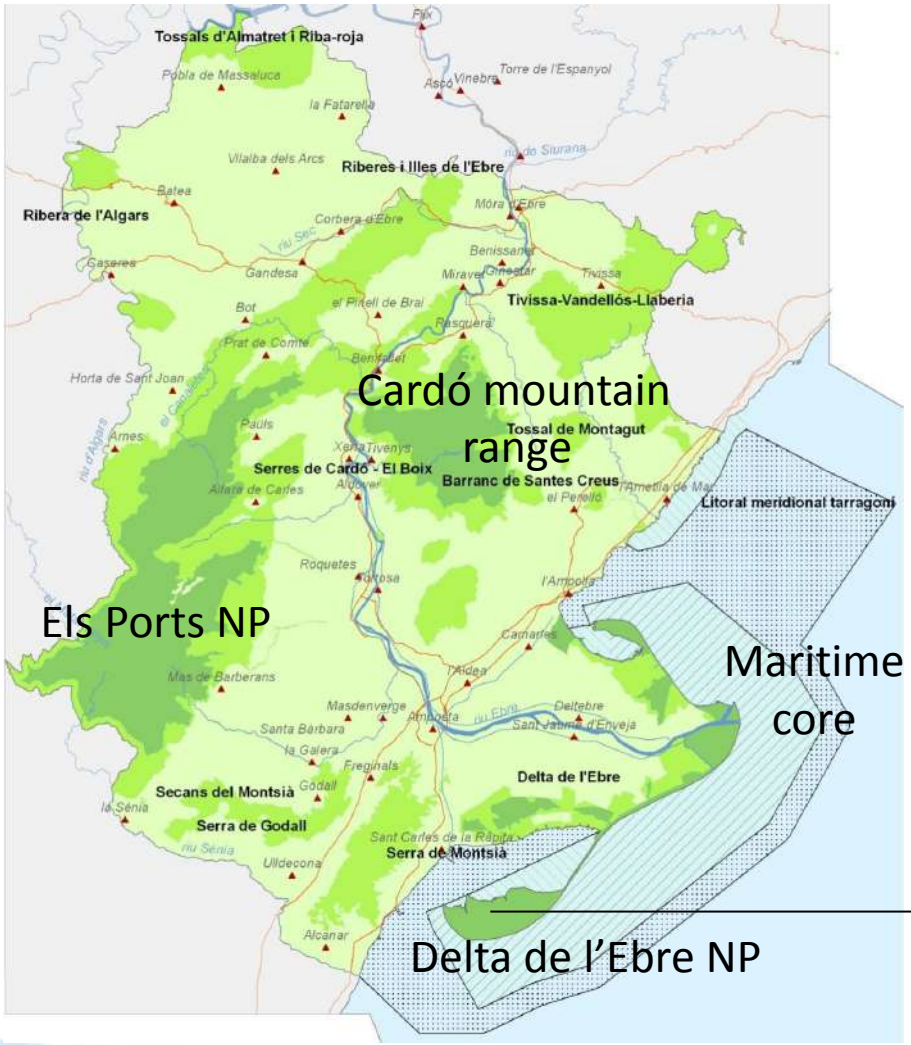
Terres de l'Ebre · Reserva de la Biosfera

CORE AREAS

1

Terres de l'Ebre Biosphere Reserve



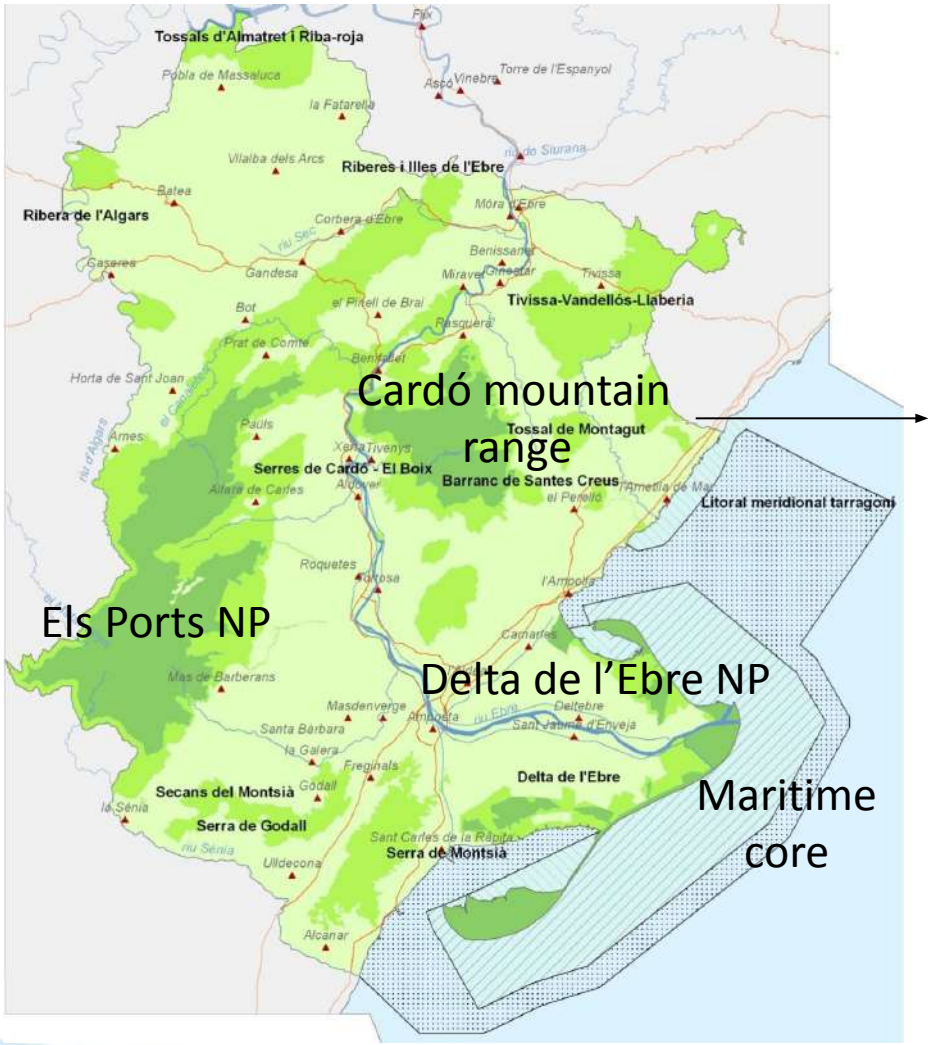
Source: Patronat de Turisme

Source: Ildefons Oliveras

CORE AREAS

1

Terres de l'Ebre Biosphere Reserve




Source: Consell Comarcal Ribera d'Ebre

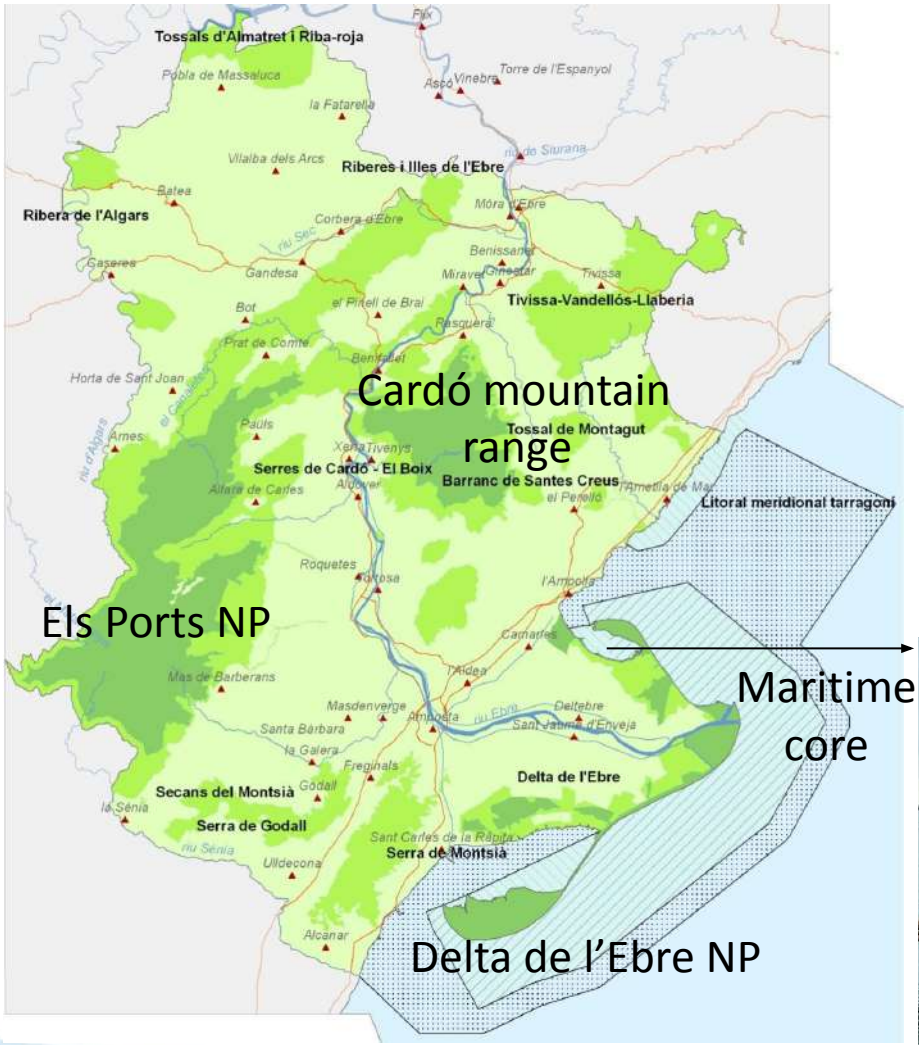

Source: Hostal la Creu


Source: Turismo Observación


Source: Península Blog

CORE AREAS

1 Terres de l'Ebre Biosphere Reserve




Source: El País


aquaila.cat


Source: VenturaRural

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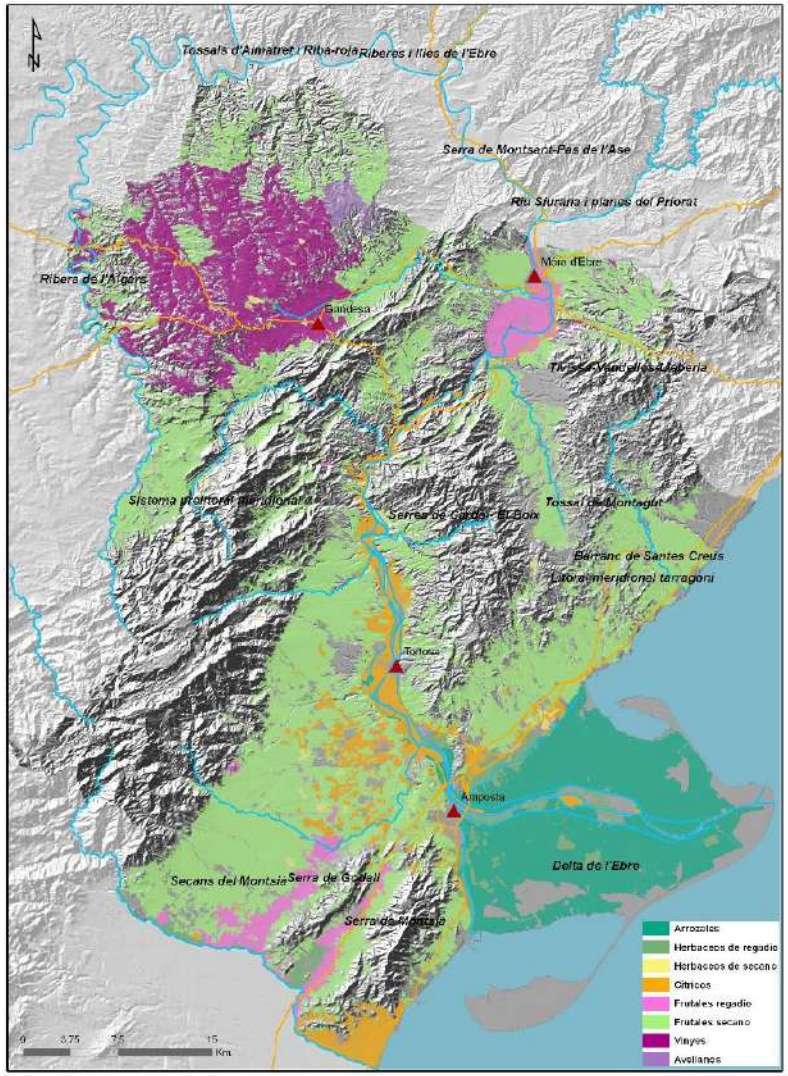
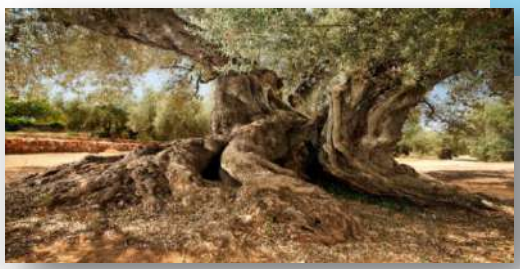
Terres de l'Ebre · RESERVA DE LA BIOSFERA ·

LAND USES

1

Terres de l'Ebre Biosphere Reserve





- Arrozales
- Herbaceos de regadio
- Herbaceos de secano
- Cítricos
- Frutales regadio
- Frutales secano
- Vinyes
- Avellanos

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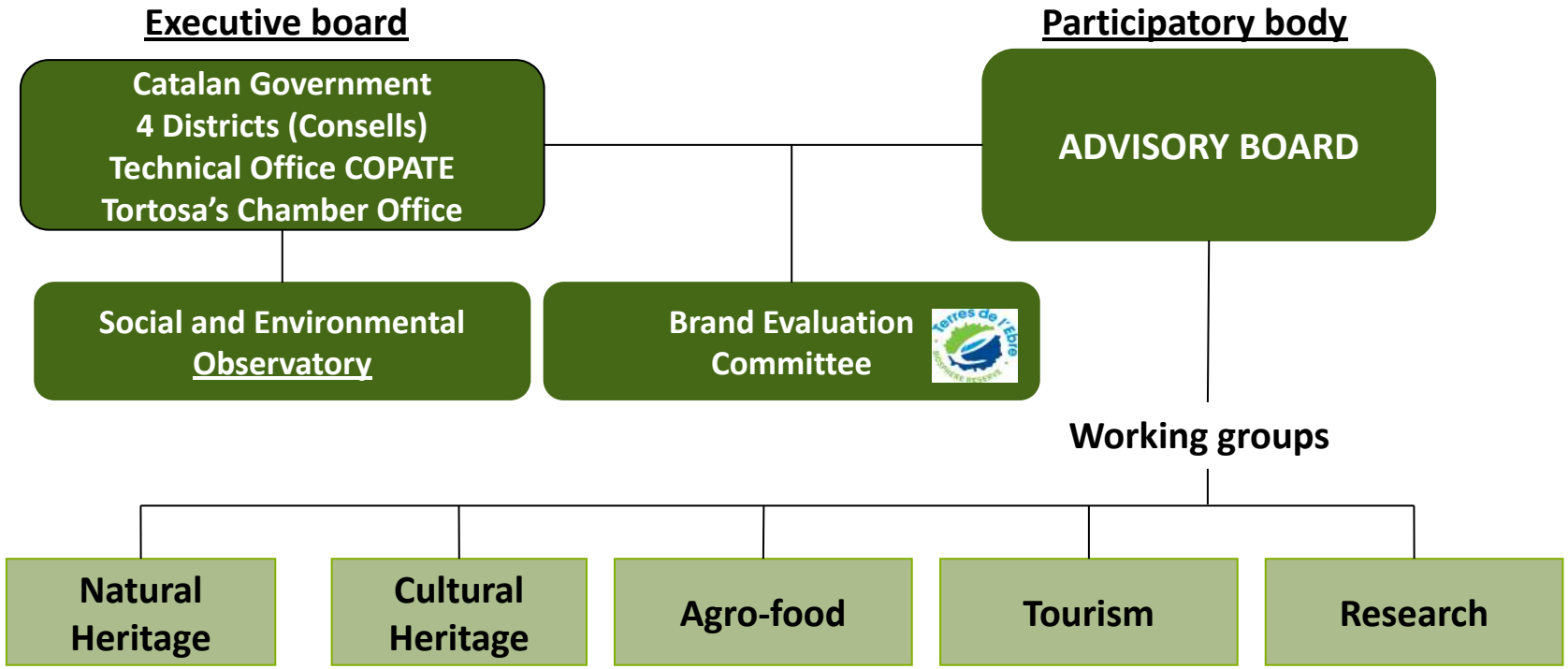
Terres de l'Ebre · RESERVA DE LA BIOSFERA ·

GOVERNANCE MODEL

1

Terres de l'Ebre Biosphere Reserve



More than 20 specialists in each group. Each group has a coordinator

THE ROLE OF BIOSPHERE RESERVES

1

Terres de l'Ebre Biosphere Reserve

Earth's climate is changing and its effects are visible

- Natural systems
- Health
- Economic activities

Biosphere Reserves

- Transversal **character**
- Territorial laboratory to implement alternative models of economic development
- Inclusive and participatory governance

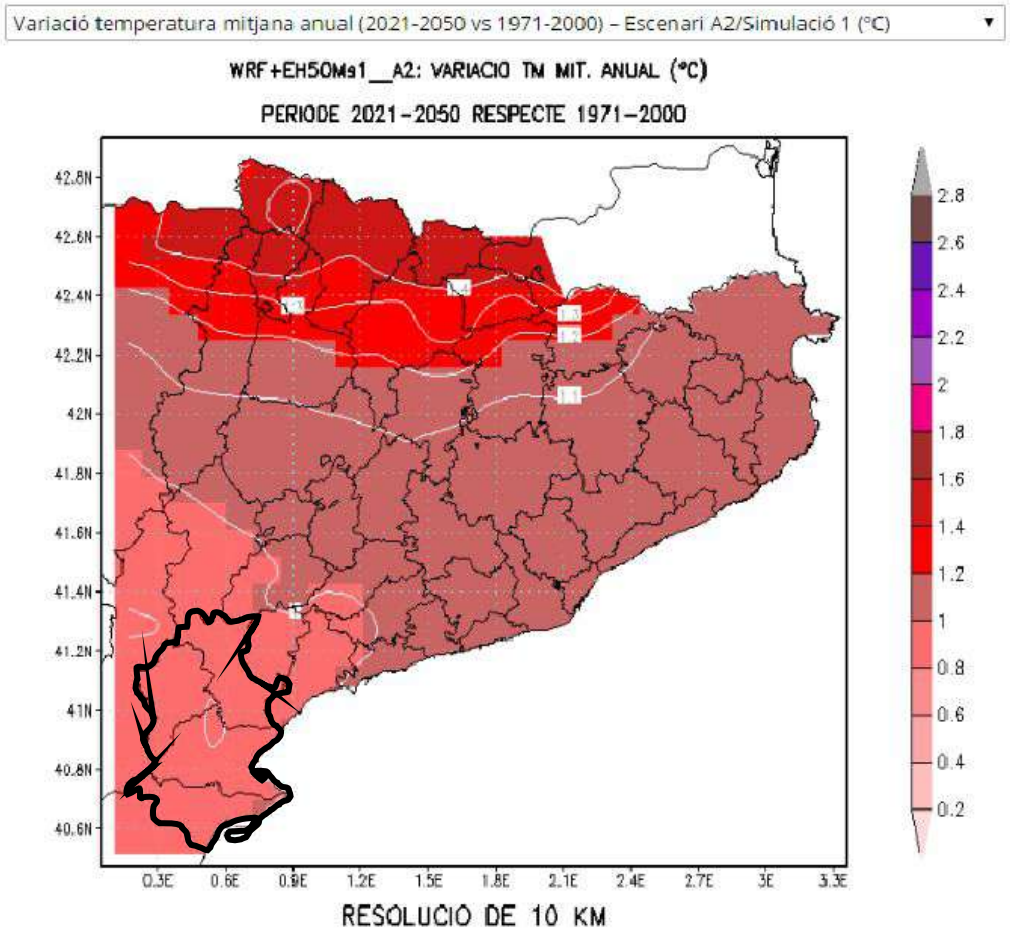
Proactive role

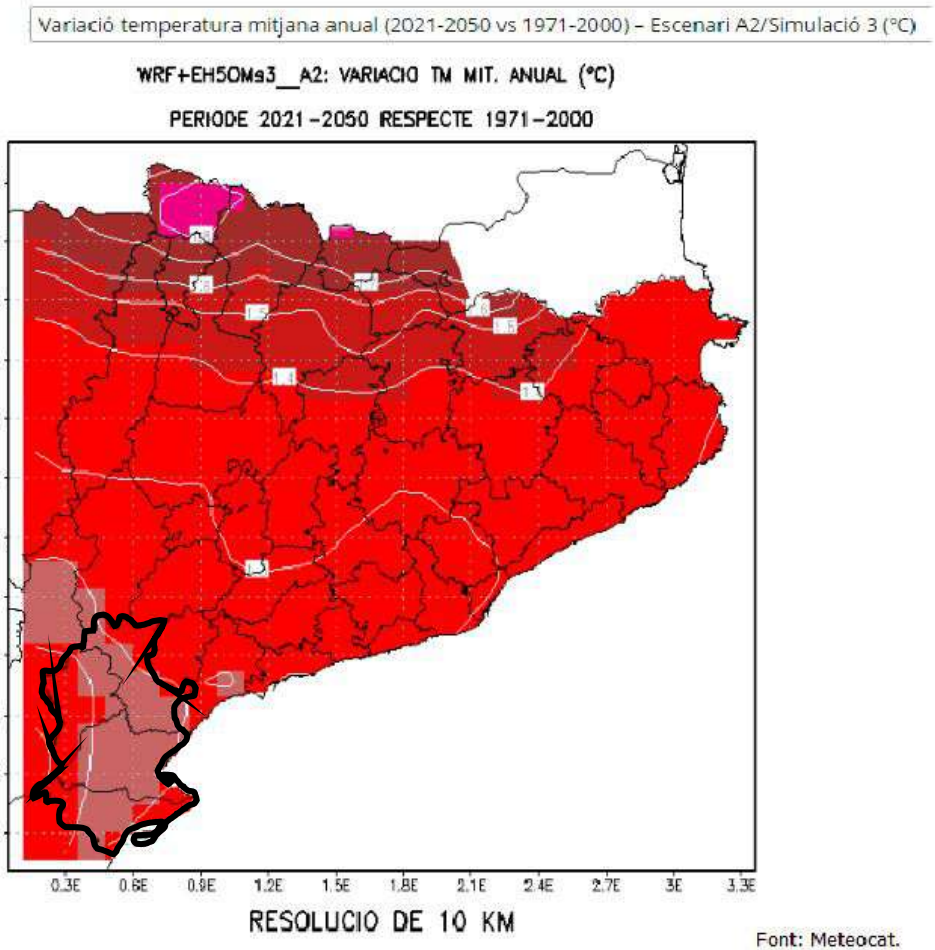
- Reduce our vulnerability to climate change
- Perform adaptation and mitigation measures to climate change

CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

2

The challenges induced by Climate Change





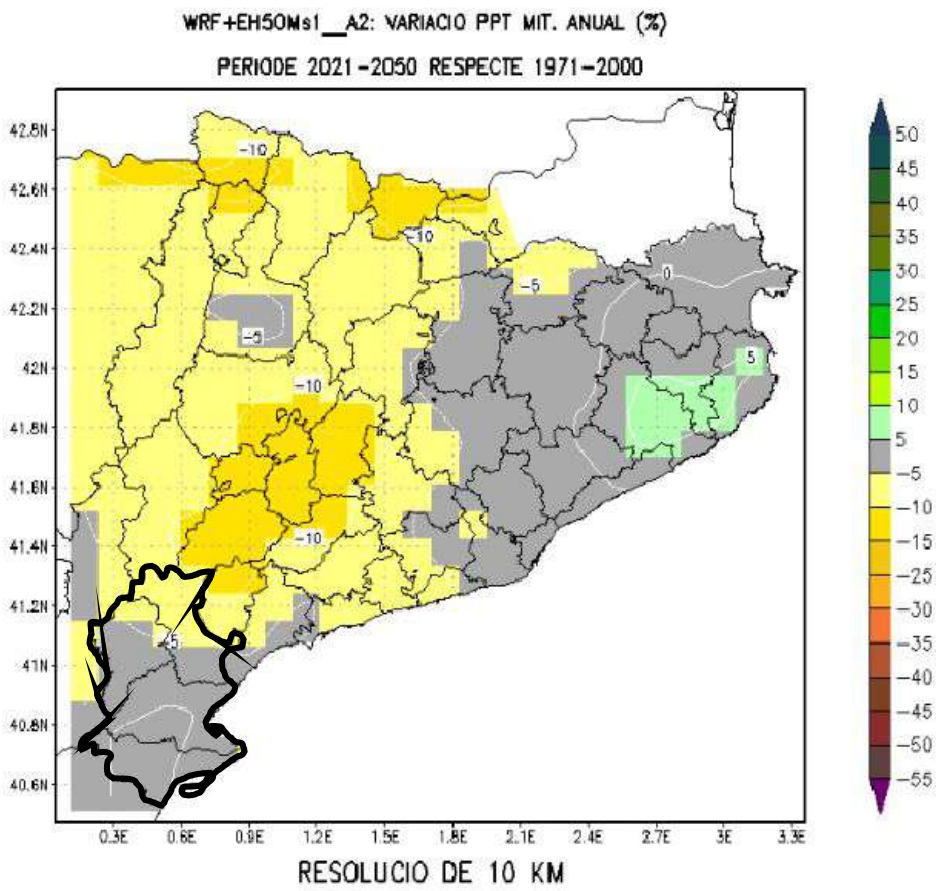
Font: Meteocat.

CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

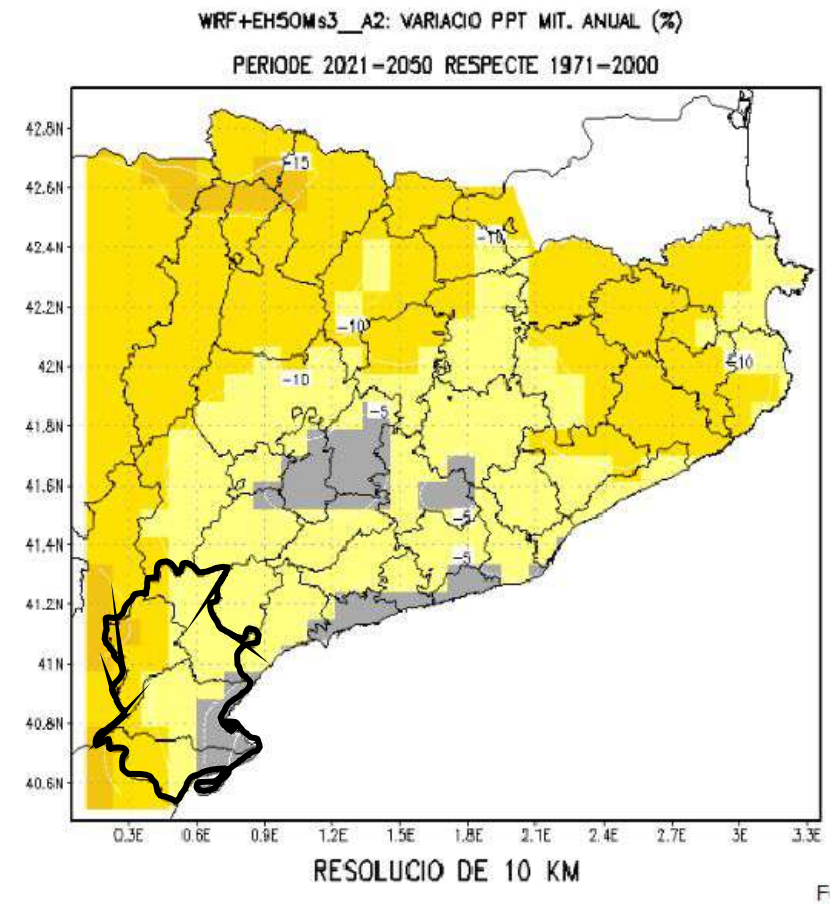
2

The challenges induced by Climate Change

Variació precipitació mitjana anual (2021-2050 vs 1971-2000) – Escenari A2 / Simulació 1 (%)



Variació precipitació mitjana anual (2021-2050 vs 1971-2000) – Escenari A2 / Simulació 3 (%)



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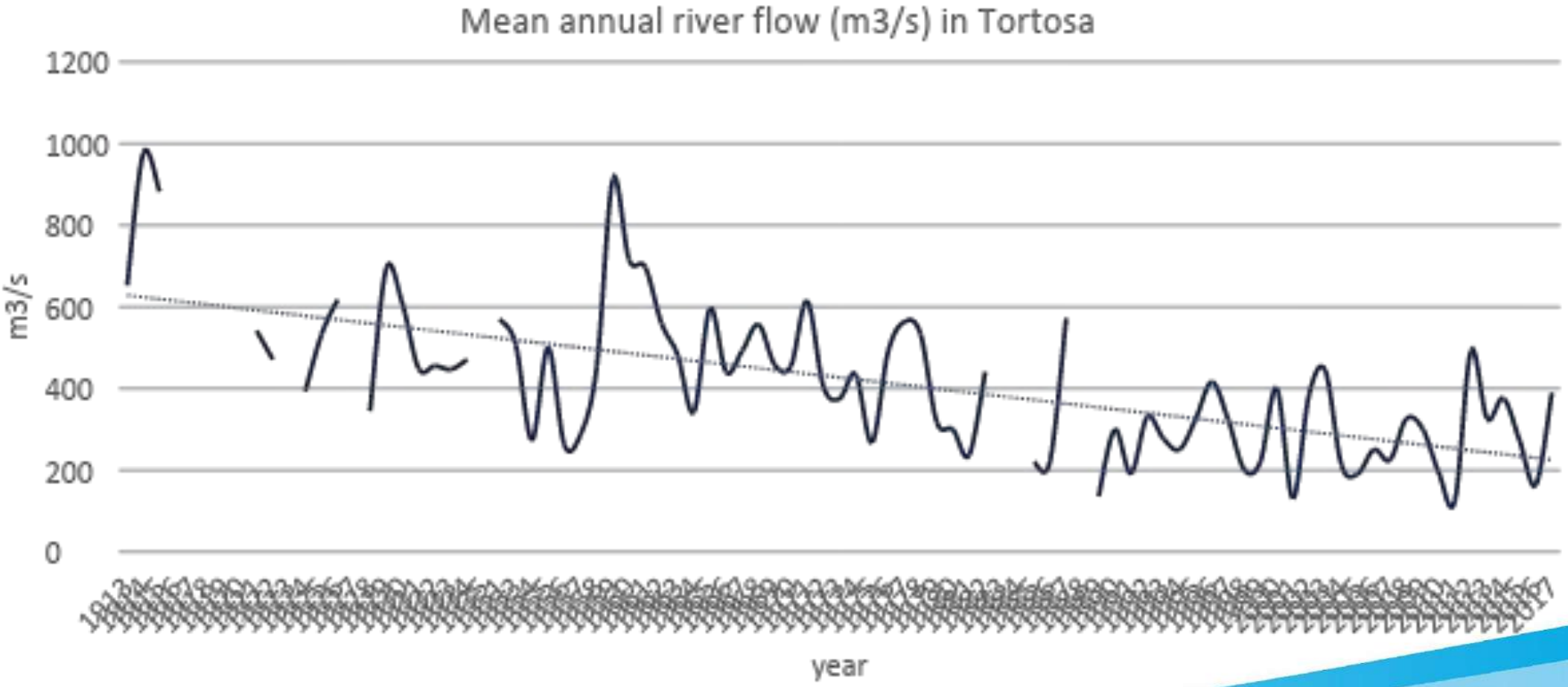
CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

2

The challenges induced by Climate Change



Source: Centro de Estudios Hidrográficos

CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

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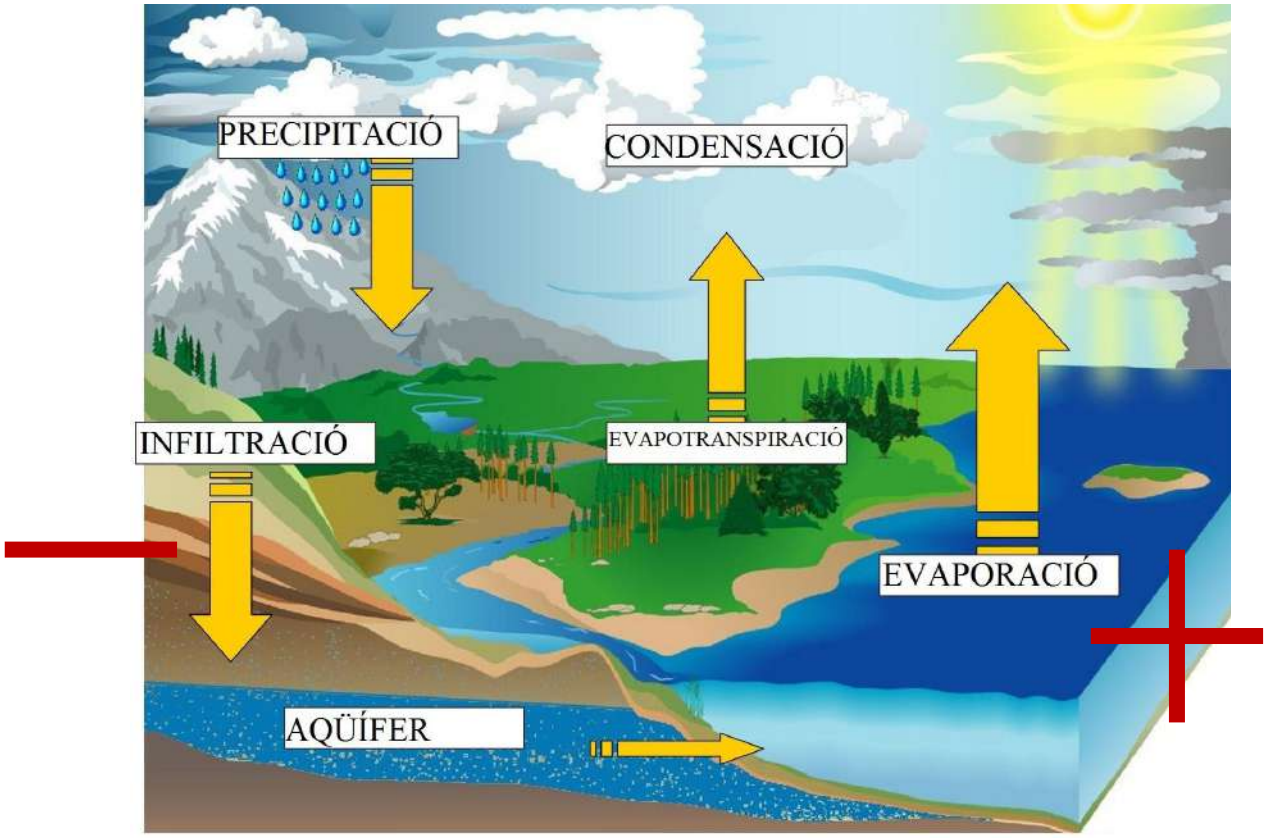
The challenges induced by Climate Change



CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

2

The challenges induced by Climate Change

20,000 ha

In the last 20 years

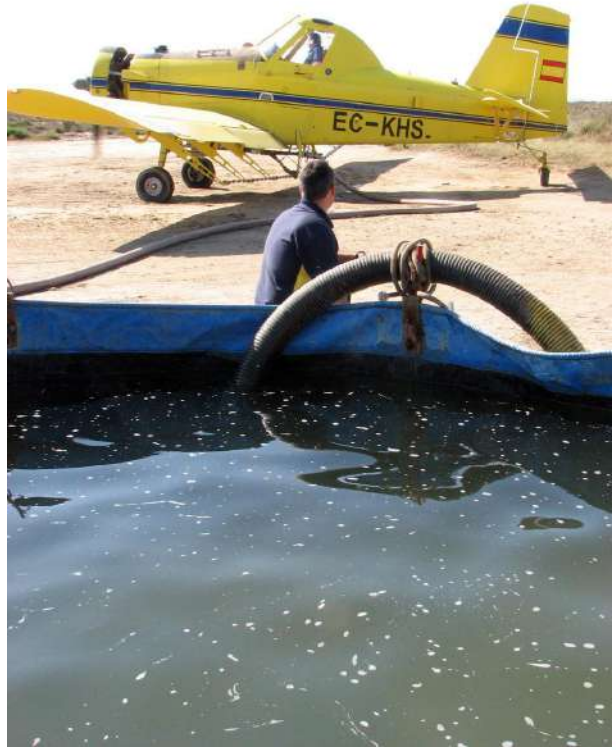
25%

High risk

CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

2

The challenges induced by Climate Change



CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

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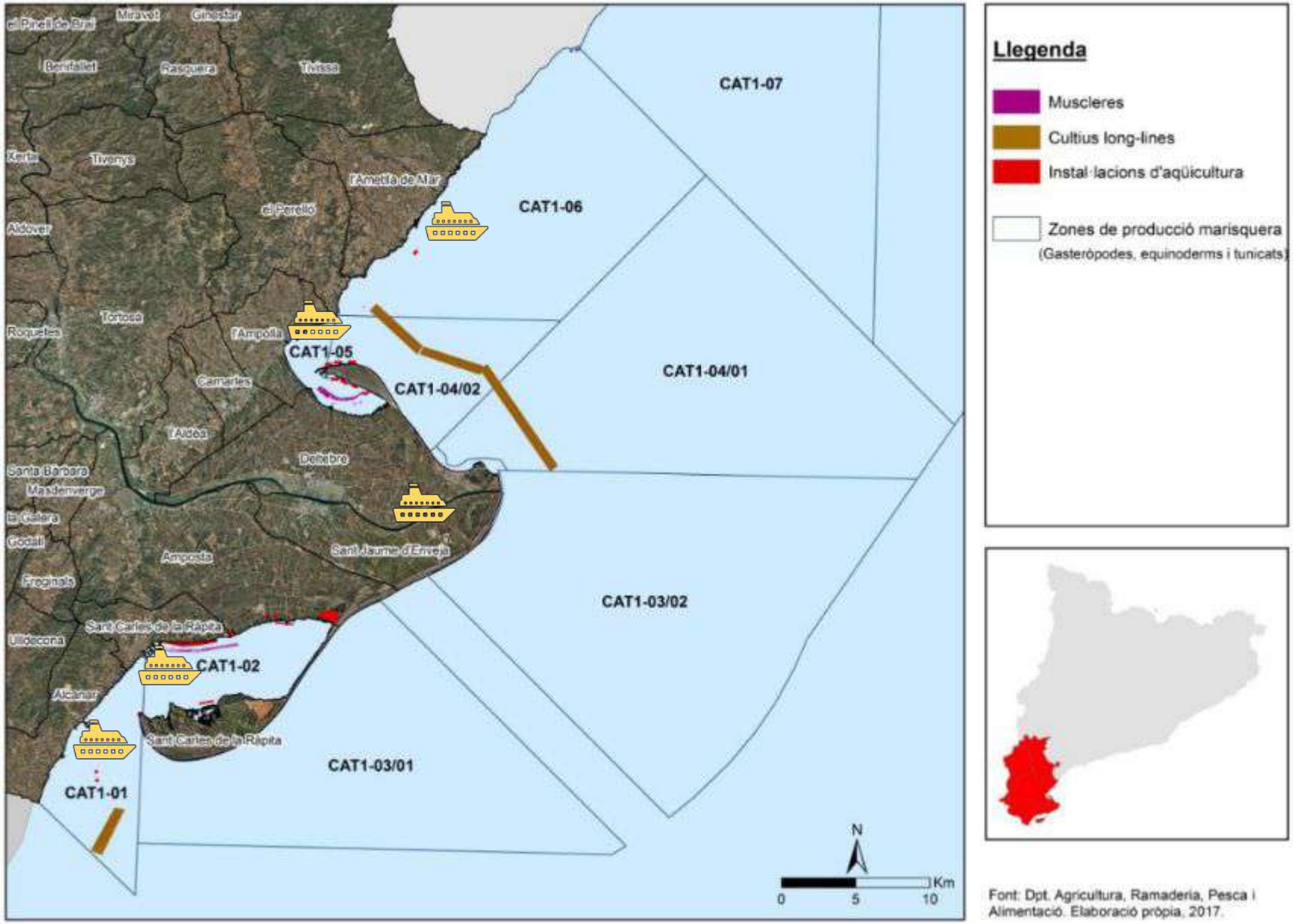
The challenges induced by Climate Change



Font: Dpt. Agricultura, Ramaderia, Pesca i Alimentació. Elaboració pròpia, 2017.

CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

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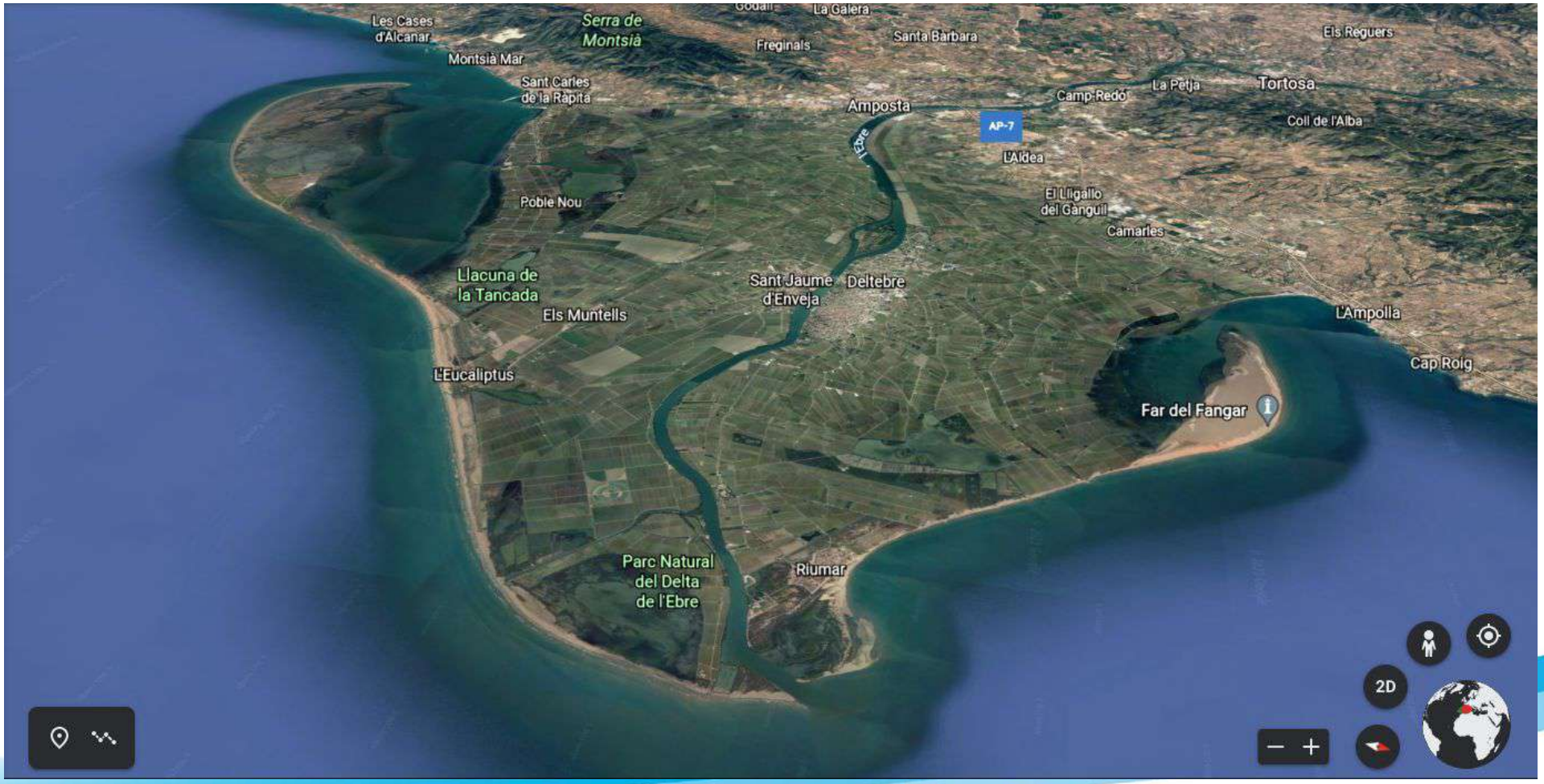
The challenges induced by Climate Change



CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

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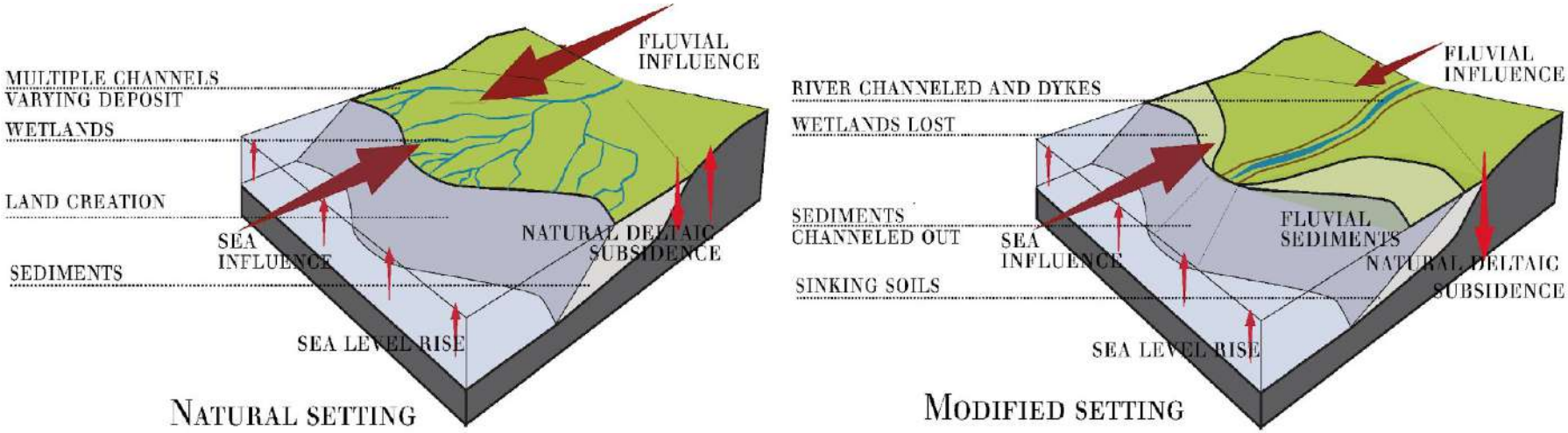
The challenges induced by Climate Change



Schematic section of delta ecosystem in natural settings and after human interventions (from Caspani, 2014)

CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

2

The challenges induced by Climate Change

CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

Año	*Capacidad de embalse (km^3)*	*Caudal sólido (10^6 Tm/año)*	*Fuente*
1877	0,00	30,00	Gorría, 1877
1944	0,72	22,00	Desconocida
1961-63	3,45	2,20	Catalán, 1969
1964	3,45	8,70	Varela et al., 1986
1976-82	3,45	0,32	Varela et al., 1986
1983-86	6,24	0,15	Palanques, 1987
1986-87	6,28	0,13	Muñoz, 1990
1988-90	6,28	0,12	Guillén y Palanques, 1992
2000	7,58	0,10	PHN
2005	7.58	0,26	Vericat y Batalla, 2005

Evolución del caudal sólido en suspensión en la desembocadura del Ebro.

Source: Molinet (2007)

CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

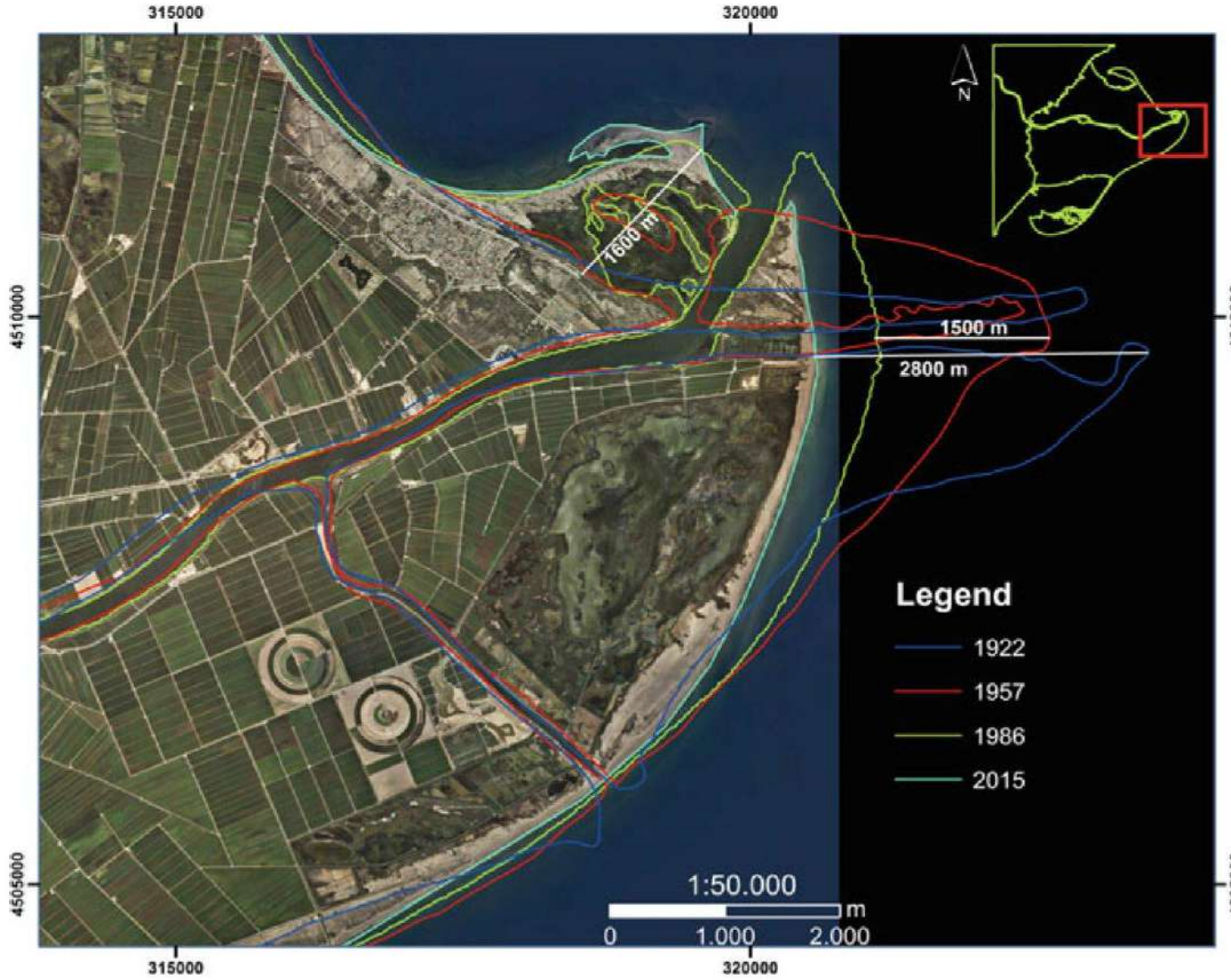
	Mequinenza	Ribarroja
Año de inicio de la actividad	1966	1969
Año de la batimetría	2008	2007
Años transcurridos	43	38
Cota máxima del embalse	124 m	76 m
Capacidad inicial	1534 hm^3	210 hm^3
Capacidad batimetría	1401 hm^3	196,9 hm^3
Sedimento total acumulado	133 hm^3	13,1 hm^3
Aterramiento anual	0,2 %	0,16 %
Aterramiento global	8,6 %	6,2 %

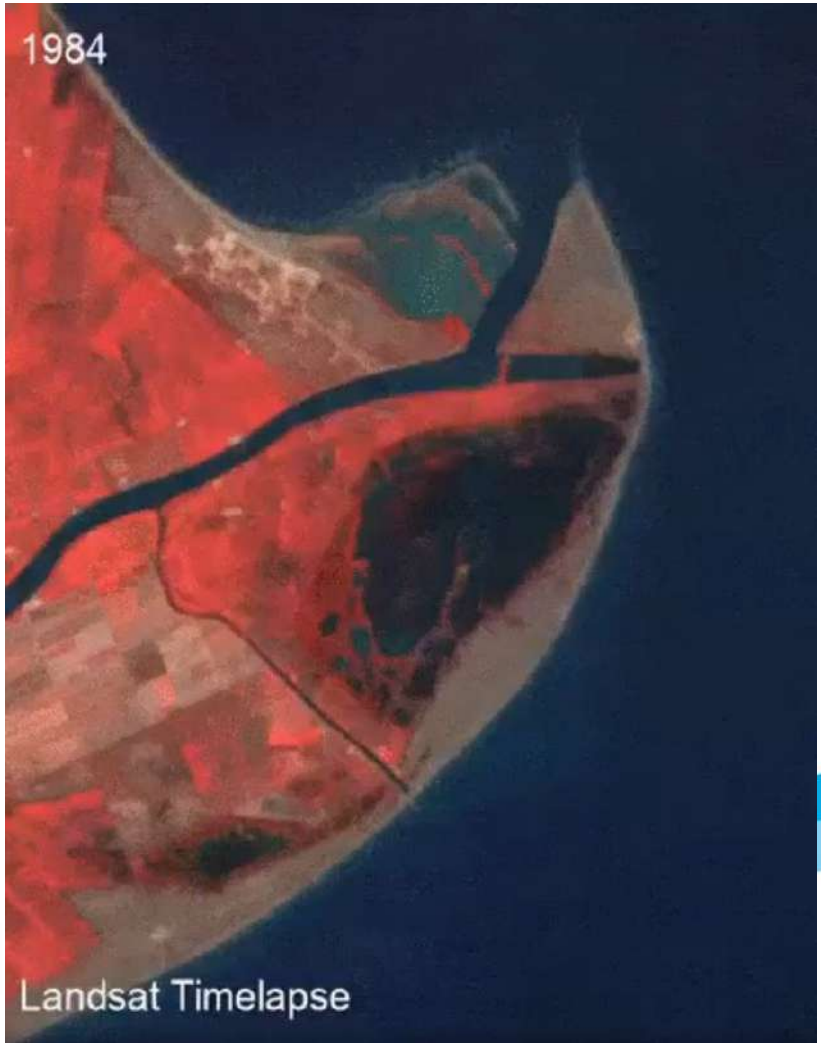
Source: Molinet (2007)

CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

2

The challenges induced by Climate Change





Changes in the coastline over the last 90 years (from I. Rodríguez and L. Somoza, 2019)

CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

Current conditions

Floods of 1m relative to sea level

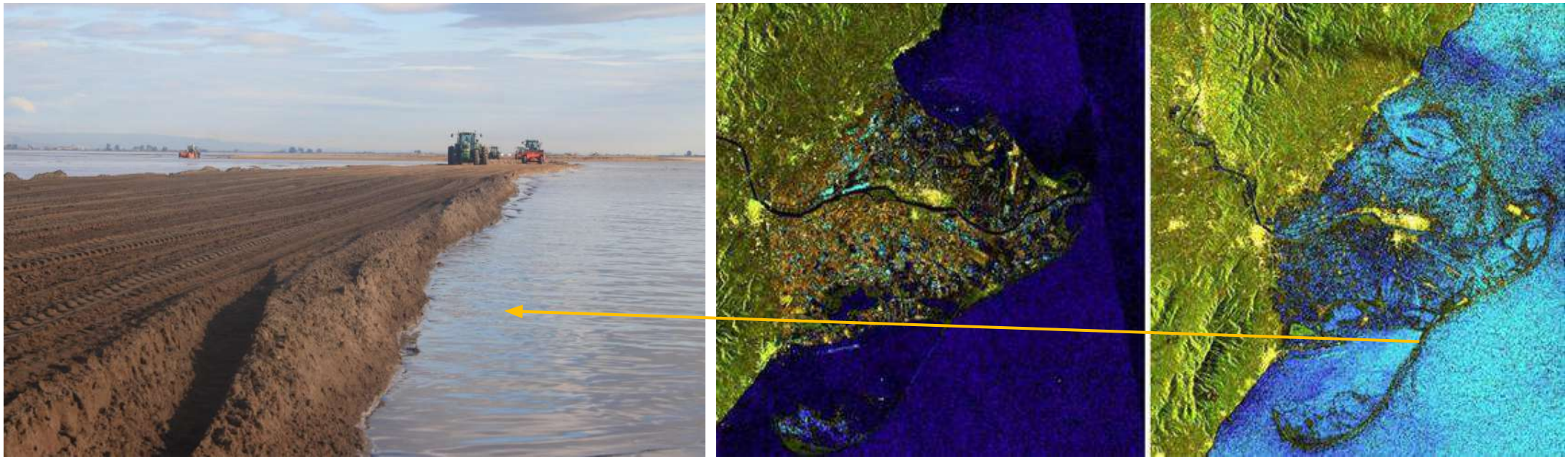
Floods of 2m relative to sea level

Floods of 3m relative to sea level

CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

2

The challenges induced by Climate Change



Storm Gloria

CHALLENGES OF CLIMATE CHANGE IN TERRES DE L'EBRE

2

The challenges induced by Climate Change

River damming, combined with sea-level rise and land subsidence, are predicted to take their toll—40% of the delta could be submerged by 2100 (Earth Observatory – NASA)

Source: Satellite image, Copernicus Sentinel 2A, 18/04/2018, 10:40 UTC

ADAPTATION TO CLIMATE CHANGE

3

Promoting resilience and adaptation to climate change

LIFE CLIMICS

LIFE15 CCA/ES/000102

"This project has been funded with support from the European Commission"

Fostering resilience. Opportunities and challenges of the local economy and society to adapt to climate change

Coordinador

Socis

Diputació Barcelona · UNIÓ DE PAGESOS · CONSELL COMARCAL ALT PENEDÈS · Oficina Catalana del Canvi Climàtic · COPATE · UGT · CCOO · Cambra de Comerç de Barcelona

Interreg Italy - Croatia CHANGE WE CARE

European Regional Development Fund

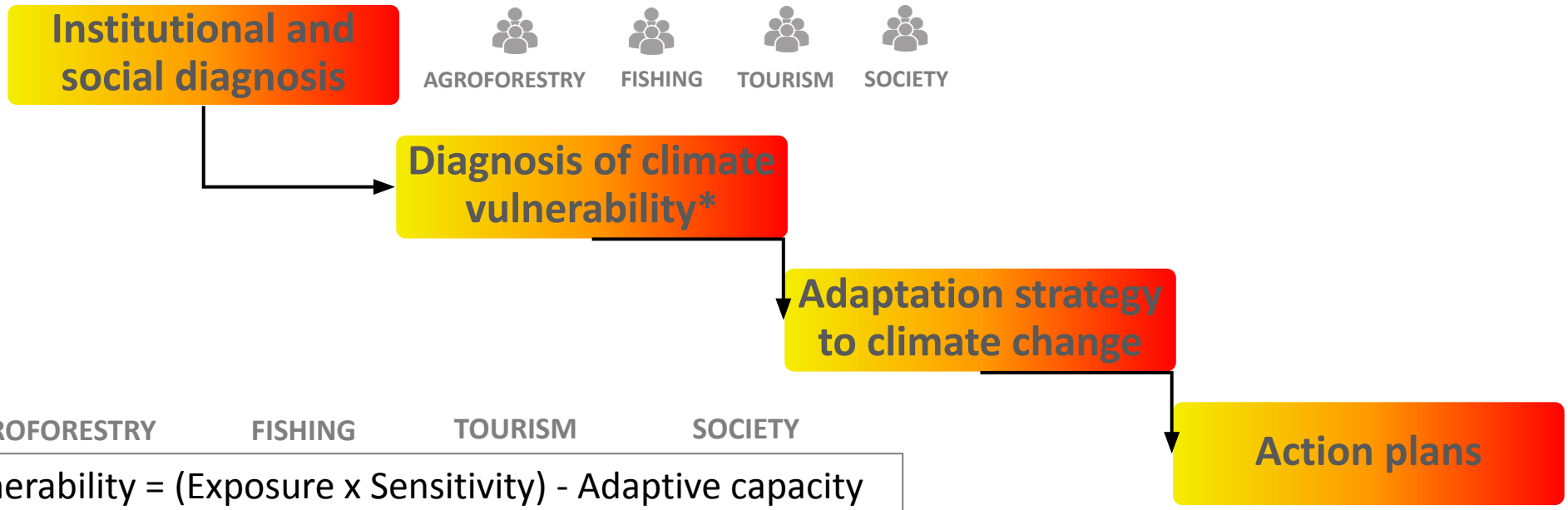
EUROPEAN UNION

Terres de l'Ebre · Reserva de la Biosfera

ADAPTATION TO CLIMATE CHANGE

3

Promoting resilience and adaptation to climate change



*Vulnerability = (Exposure x Sensitivity) - Adaptive capacity

The more exposed and sensitive an economic sector is to a certain risk associated with climate change, and the less responsiveness (adaptation) it has, the greater its vulnerability.

ADAPTATION TO CLIMATE CHANGE - PARTICIPATIVE PROCESS

3 Promoting resilience and adaptation to climate change

MeSACCs

AGROFORESTRY FISHING TOURISM SOCIETY

MeSACCs – Mesas Sectoriales para la Adaptación al Cambio Climático

Structures for sectorial and thematic debate, which bring together the representatives of each sector.

MeTACC

MeTACC – Mesa Territorial para la adaptación del Cambio Climático

It constitutes the plenary of the process, a body represented by the key stakeholders of the territory responsible for reaching agreements.

ADAPTATION TO CLIMATE CHANGE - PARTICIPATIVE PROCESS

3 Promoting resilience and adaptation to climate change

Estratègies i accions en l'àmbit agroforestal

Estratègia 1: Implementar tècniques d'agricultura de precisió en el context d'una gestió integrada dels regadius a nivell territorial

Acció 1.1. Establiment un mapa de regs i concessions

Acció 1.2. Creació i posada en marxa de l'Observatori de la sequera

Estratègia 2. Introduir conreus amb noves varietats i/o espècies adequades a la nova situació i recuperar varietats autòctones

Acció 2.1. Assaig de conreus amb varietats/espècies adaptades als nous condicionants climàtics

Acció 2.2. Recuperació de conreus i varietats locals adaptades a les condicions de sequera.

Estratègia 3. Reforçar l'experimentació amb la sembra en sec i recuperar i potenciar pràctiques agroculturals del conreu de l'arròs

Acció 3.1. Continuar l'experimentació de la sembra en sec de l'arròs

Acció 3.2. Identificació i assaig de bones pràctiques agroculturals en el conreu de l'arròs amb menor demanda hídrica i/o major resistència a la salinitat

Acció 3.3. Definició d'un model agronòmic integral per al Delta de l'Ebre en un escenari climàtic advers

Estratègia 4: Aprofitar la biomassa com a font d'energia

Acció 4.1. Impuls a la demanda de biomassa mitjançant l'activació del consum en equipaments públics.

Acció 4.2. Impuls a la demanda biomassa en la ramaderia intensiva

Acció 4.3. Creació d'un clúster territorial de biomassa

Estratègia 5: Recuperar i gestionar els espais agroforestals

Acció 5.1. Elaboració de la cartografia dels espais agraris periforestals i agroforestals abandonats

Acció 5.2. Elaboració i implementació d'un pla de gestió de treballs forestals i agraris lligats al manteniment dels espais agroforestals

Acció 5.3. Creació d'un Banc de Terres periforestals o agroforestals abandonades

Estratègia 6: Potenciar accions de gestió forestal que millorin l'estructura i qualitat de les masses forestals i permetin una millor adaptació als riscos associats al canvi climàtic

Acció 6.1. Revisió i redacció dels plans d'ordenació forestal públics i privats amb incorporació de criteris climàtics

Acció 6.2. Gestió activa dels espais amb elevada densitat de combustible

Acció 6.3. Desenvolupament del Projecte Ramats x Paisatge

Estratègies i accions en l'àmbit de la pesca i aqüicultura

Estratègia 7: Implementar mesures d'adaptació climàtica en l'àmbit de l'aqüicultura

Acció 7.1. Diversificació d'espècies de cultiu en aqüicultura de mol·luscs

Acció 7.2. Adaptació de les estructures dels musclos per fer granges d'orades

Acció 7.3. Cultiu off-shore de musclo en els períodes d'elevades temperatures

Acció 7.4. Disponibilitat d'una hatchery local de bivalves degudament gestionada que abasteixi als productors del Delta

Acció 7.5. Cultiu d'algues en les zones litorals, com activitat econòmica complementària

Estratègia 8: Millorar la qualitat de l'aigua de les badies:

Acció 8.1. Aportació d'aigua dolça mitjançant by-pass dels canals als desaigües

Acció 8.2. Establiment de nous criteris de desembassament en funció de la qualitat de les badies

Estratègia 9: Diversificar i promoure espècies de peixos poc conegudes:

Acció 9.1. Promoció del consum d'espècies de peixos amb valor culinari poc reconegut

Estratègies i accions e l'àmbit turístic

Estratègia 10: Crear un model de turisme adaptat als nous escenaris climàtics.

Acció 10.1. Implementació d'un pla de desestacionalització de l'oferta turística.

Acció 10.2. Potenciació de la marca Terres de l'Ebre com a destinació turística sostenible (Green Destination).

Acció 10.3. Creació del clúster ecoturístic i de productes turístics complexos.

Estratègia 11: Definir un nou sistema de planejament de l'activitat turística adaptada al canvi climàtic

Acció 11.1. Actualització de la planificació turística amb la incorporació de criteris de vulnerabilitat i adaptabilitat climàtica.

Acció 11.2. Revisió amb criteris d'adaptació climàtica dels criteris dels equipaments i serveis a les platges i de la seva integració dins els sistemes de qualitat.

Acció 11.3. Implementació de programes d'ambientalització del sector turístic encaminats a l'adaptació climàtica

Estratègies i accions transversals

Estratègia 12: Incrementar els nivells de vigilància, control i tractament de les espècies invasores i/o molestes

Acció 12.1. Increment de la vigilància i control d'espècies invasores.

Acció 12.2. Potenciació i actualització dels programes de control de mosquit i mosca negra a les Terres de l'Ebre.

Estratègia 13: Minimitzar els riscos del canvi climàtic sobre la salut de les persones

Acció 13.1. Continuació dels sistemes de vigilància i control d'aigua de consum humà.

Acció 13.2. Millora i extensió del sistema d'avisos i alertes per episodis meteorològics amb potencials efectes en la salut.

Acció 13.3. Creació d'una base de dades amb series temporals sobre riscos climàtics i salut humana

Estratègia 14: Establir els instruments de governança adients per fer front als riscos associats al canvi climàtic

Acció 14.1. Determinació d'una institució encarregada de fer el seguiment de l'Estratègia i Pla d'Acció.

Acció 14.2. Constitució de Grups de Treball Interadministratius i Multisectorials de l'aigua.

Acció 14.3. Recuperació de les accions pendents del PIPDE (pla integral de protecció del Delta de l'Ebre) i implementació de les mesures del projecte pilot de mesures de mitigació i adaptació al canvi climàtic al Delta de l'Ebre (Admiclim)

Estratègia 15: Impulsar mesures per a la millora de la biodiversitat i el paisatge en el context del canvi climàtic

Acció 15.1. Cartografia i inventari d'hàbitats d'interès comunitari i d'espècies i ecosistemes vulnerables al canvi climàtic.

Acció 15.2. Implementació d'un pla de custòdia adaptativa d'hàbitats sensibles al canvi climàtic.

ADAPTATION TO CLIMATE CHANGE - PARTICIPATIVE PROCESS

3

Promoting resilience and adaptation to climate change

CRITERIA	PRIORITY
VIABILITY	1,20
TRANSVERSALITY	1,30
REPLICABILITY	1,90
INNOVATION	2,10
EXECUTION TIME	2,40

OPTIONS	PRIORITY
Economic viability	1,50
Techical viability	1,75
Social viability	1,75
Political/institutional viability	2,13

OPTIONS	PRIORITY
Replicable in 2 territories	1,25
Replicable in 1 territory	1,58
Not replicable	2,67

OPTIONS	PRIORITY
Short term	1,67
Mid term	1,89
Long term	2,11

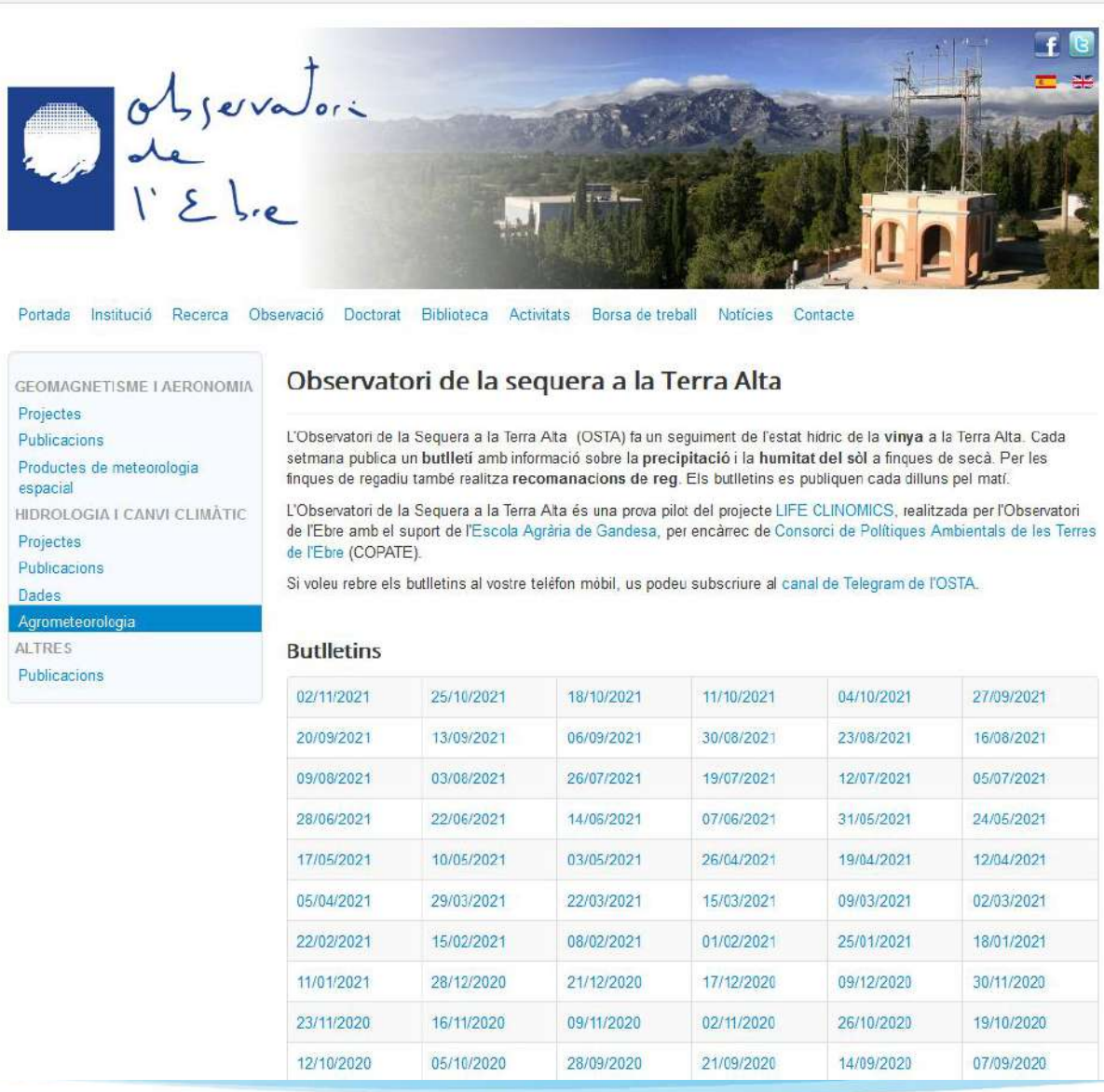
OPTIONS	PRIORITY
Cross-cutting and sectoral objectives	1,33
Objectives for different sectors	1,83
Objectives for just 1 sector	2,75

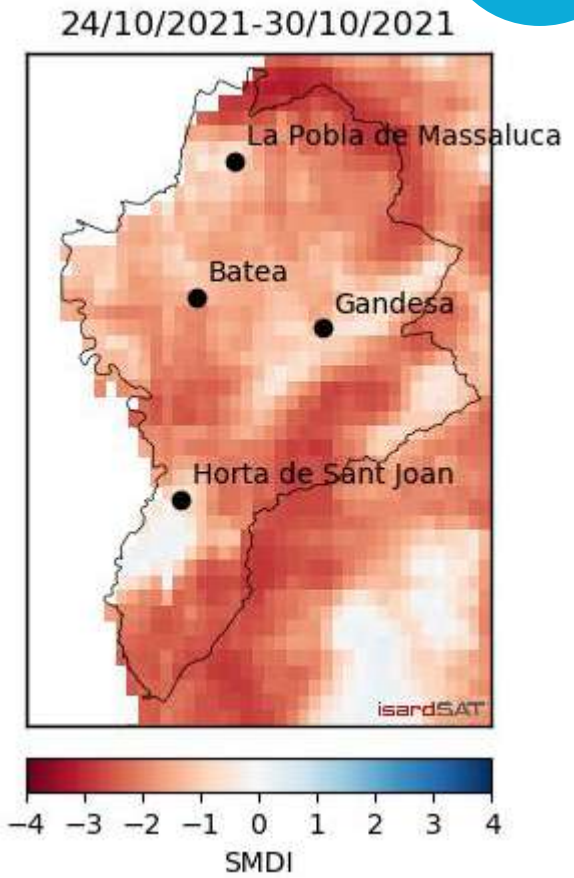
OPTIONS	PRIORITY
Governance innovation	1,38
Technical innovation	1,88
Economic/commercial innovation	2,25

DROUGHT OBSERVATORY

3

Promoting resilience and adaptation to climate change





Estació	Índex Humitat Sòl (%)	Variació (p.p.)	Cal regar?	Reg a aplicar (mm/dia)	Temps de reg (hores/dia)
Batea	96.6	+5.3	No	-	-
Gandesa	79.4	+3.2	No	-	-
Horta Sant Joan	80.4	+6.5	No	-	-
Pobla Massaluca	116.4	+6.3	No	-	-

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LOCAL HATCHERY

3

Promoting resilience and adaptation to climate change

Importance of the economic sector:

- The production of bivalve molluscs in Catalonia is carried outmostly (98%) in the Ebro Delta.
- In the bays of the Ebro Delta (Alfacs and Fangar) there are 45 SMEs dedicated to the production and purification of bivalve molluscs.
- There are 1000 jobs (direct and indirect).
- Annual turnover of 7 million euros.

Problem:

- The aquaculture sector detects mortality from 50% to 80% of oyster production (C. gigas) in the Ebro Delta, due to mortality caused by pathogens and rising temperatures.

Solution:

- The curly oyster (Crassostrea gigas) is a eurythermic species that adapts better than the mussel (Mytilus sp.) to high temperatures, not significantly affecting its survival.
- The oyster (which does not exceed one year of cultivation) also adapts quite well to acidic environments (up to a pH of 7.3) according to preliminary data from Ifremer (France).

FINAL REMARKS

3 Promoting resilience and adaptation to climate change

1. To manage natural heritage: conservation of biodiversity, habitats and landscapes.

2. To ensure territorial quality and social cohesion.

3. To boost green economy and bioeconomy.

4. To foster research, innovation, communication and education.

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EUROPEAN UNION

Terres de l'Ebre RESERVA DE LA BIOSFERA

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Tackling climate change on the Adriatic coasts: CHANGE WE CARE at a glance

CHANGE WE CARE | CNR-ISMAR | Davide Bonaldo

Final Conference | On-line| November 11th, 2021.

European Regional Development Fund

CHANGE WE CARE IN A NUTSHELL

Climate cHallenges on coAstal and traNsitional changing arEas: Weaving a Cross-Adriatic REsponse

PRIORITY AXIS 2 "SAFETY AND RESILIENCE"

SO 2.1 Improve the climate change monitoring and planning of adaptation measures tackling specific effects, in the cooperation area

PROJECT DURATION
01 .01.2019 –

ERDF
€ 2,295,663.00

TOTAL BUDGET
€ 2,700,780.00

11 Partners (6 IT + 5 HR)

CHANGE WE CARE goals:

- → *Characterize the present state…*
- → *…and the possible future scenarios in coastal and transitional systems*
- → *Identify problems and needs and suggest **adaptation** strategies*

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PROJECT STRUCTURE

WP2 – Communication Activities

1. Start-up activities
2. Promotional and dissemination material
3. Local, national, international events
4. Networking activities

WP1 – Project Management

1. Start-up activities
2. Day-to-Day PM, coordination, communication
3. Steering and monitoring
4. Financial management

WP3 – Knowledge-base improvement: status and recent trends of coastal and transitional system processes

1. Hydrological and meteo-marine physical setting
2. Geological/geomorphological setting
3. Water and sediment fluxes from mainland
4. Aquatic habitats and biodiversity status and trends
5. hydro-morphological factors and transitional habitats
6. Integrated strategies for filling knowledge gaps

WP4 – Evolution Dynamics in case study areas and Northern/Central Adriatic under CC

1. Evolution of key physical quantities and fluxes
2. Morphological evolution at the multi-decadal scale
3. Evolution of coastal and transitional ecosystems
4. Definition of a common monitoring system
5. Training: observational data and numerical model fields

WP5 – Adaptation plans and measures for increasing safety and resilience in 5 Case Study Areas

1. Stakeholder engagement
2-6. Adaptation plan - design of interventions on:
Neretva River, Jadro river, Vran lake (Vransko Jezero)
Banco di Mula di Muggia, Po River Delta

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PILOT SITES – Postcards from the Adriatic coasts

1. **VRAN LAKE**
2. **NERETVA RIVER DELTA**
3. **JADRO RIVER AND KAŠTELA BAY**
4. **BANCO DELLA MULA DI MUGGIA**
5. **PO DELTA**

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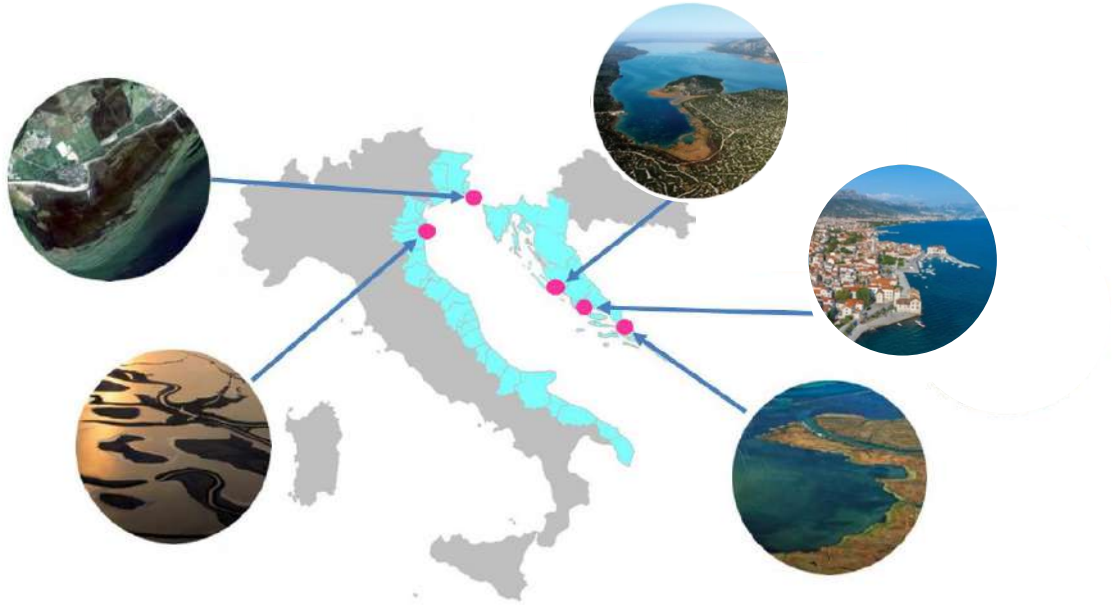
PILOT SITES – Benefits from cooperation

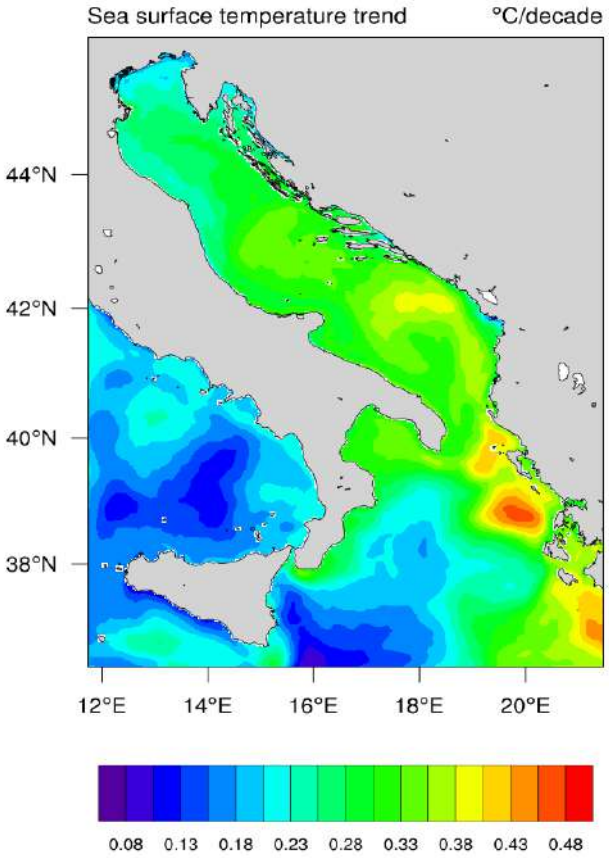


- Different coastal landscapes, common regional-scale drivers
- Adriatic coast as a paradigm for adaptation to climate change in mid-latitude microtidal systems
- Sharing experiences and good practices and optimization of future efforts
- Setting the ground for future cross-border policies

PRESENT STATE AND RECENT TRENDS

HYDRODYNAMICS AND METOCEAN

- Observational and model-based assessment
- Basin-scale and pilot site-scale analysis and datasets



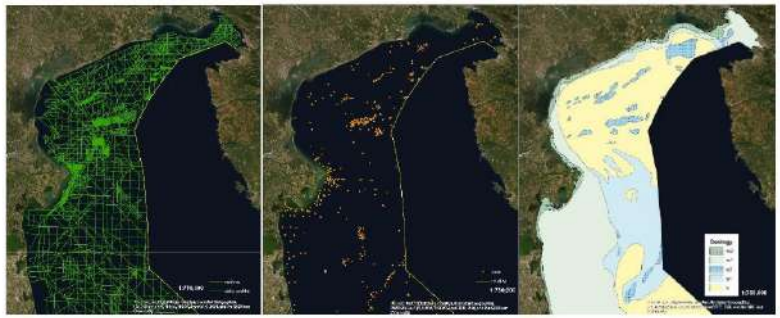
- Decrease in precipitation rates in the most of the basin
  → a negative trend in freshwater budget in the Adriatic Sea
- Weakening of the Adriatic thermohaline circulation
- Strong increase in salinity and temperature, with the largest trend in coastal regions
- Decrease in dissolved oxygen content in deep Adriatic layers
- Acceleration of sea level rise

PRESENT STATE AND RECENT TRENDS

GEOLOGY AND SEDIMENTOLOGY

- Assessment and collation of existing data
- Geomorphological maps for the pilot sites
- Technical report on sediment stocks in alluvial coastal systems

- Diverse climate-related risks depending on local geological setting, dynamics and land use
- Strong variability in data availability
- Need for long-term monitoring strategies

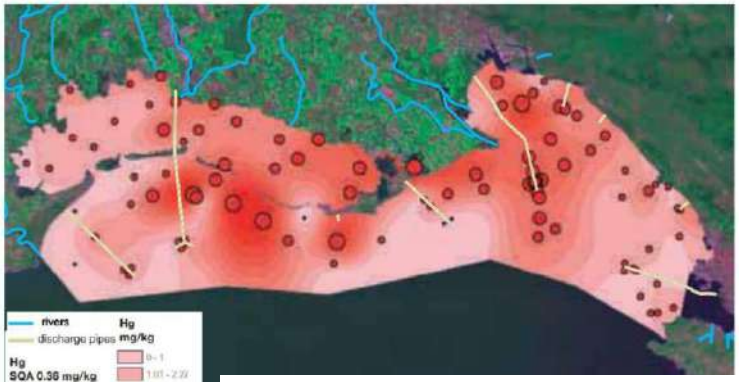


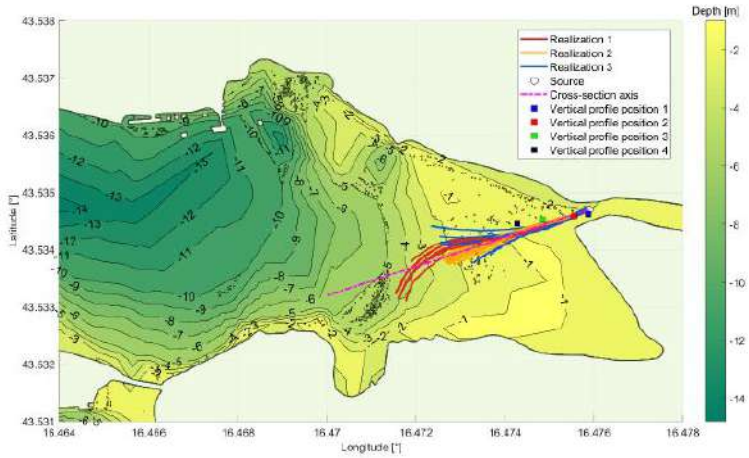
PRESENT STATE AND RECENT TRENDS

FLUXES AND WATER QUALITY

Report and data on water, sediment and contaminant fluxes in the Pilot Sites

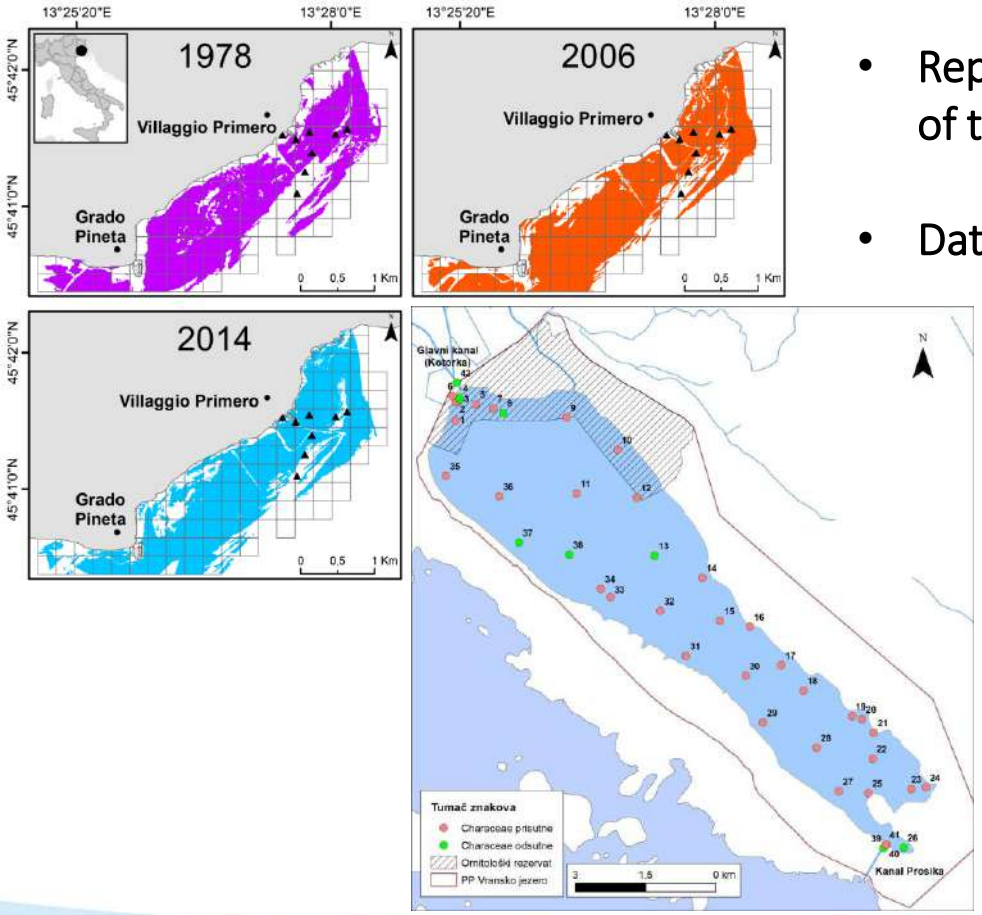
- Generalized trend to decreasing freshwater discharge
  → Salt intrusion in the coastal areas
- Comparatively higher water and sediment discharge in the Italian Pilot Sites
- Poor predictability of groundwater fluxes in Croatian sites due to karstic soil





PRESENT STATE AND RECENT TRENDS

ECOLOGY

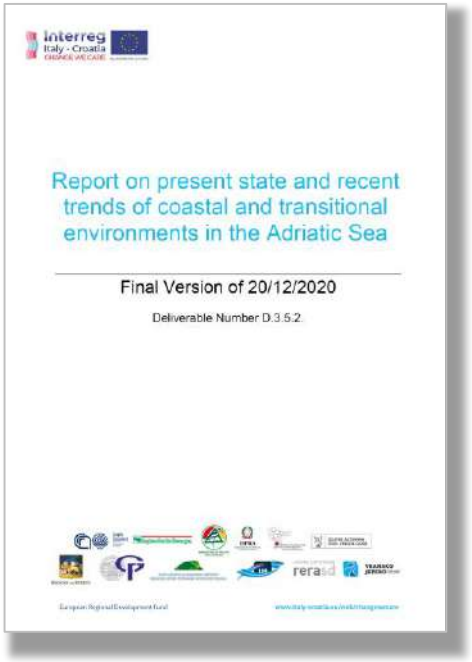


- Report based on existing ecological data and assessment of the knowledge gaps
- Dataset for GIS applications

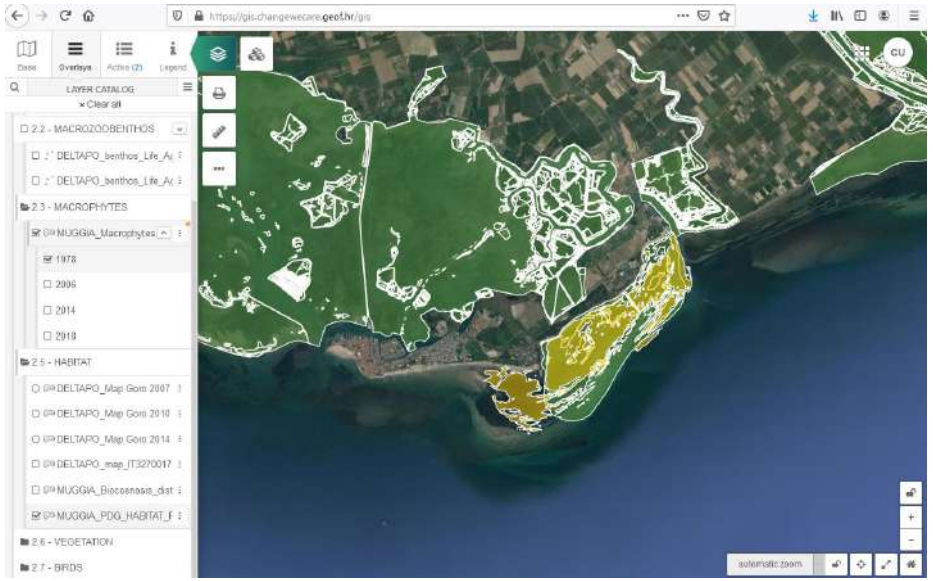
- Harmonization of the information on physico-chemical paramenters, protected habitats and species, and biological communities in the Pilot Sites
- Operational plans for data acquisition in the Pilot Sites

PRESENT STATE AND RECENT TRENDS

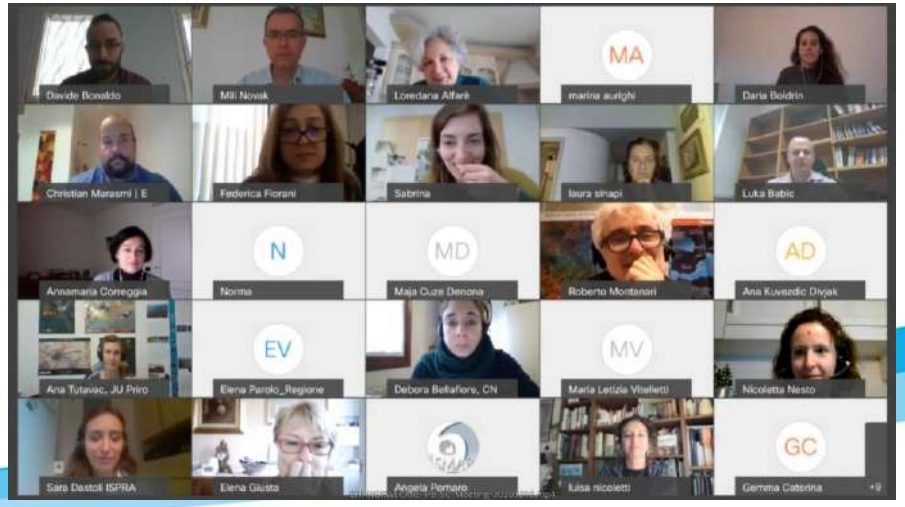
AN INTEGRATED VIEW



- Report on transitional environments
  - CHANGE WE CARE webGIS



- «Exchange of experience» meetings

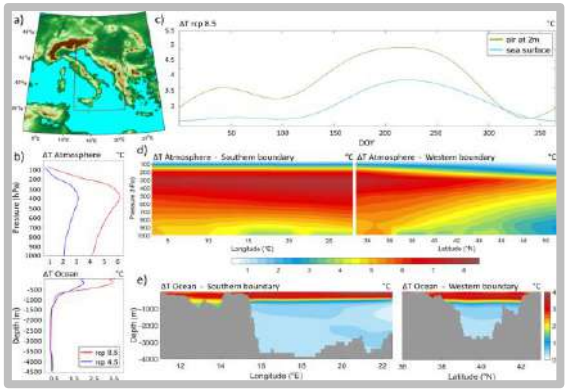


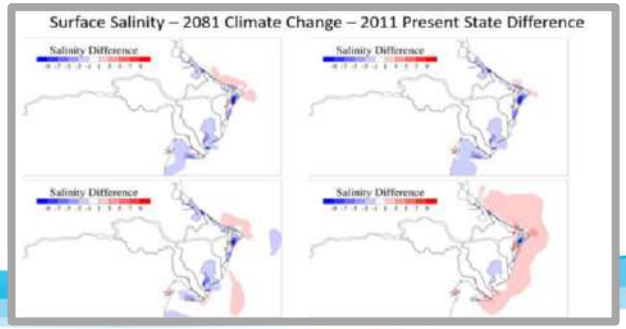
- A shared interdisciplinary view on the functioning of Adriatic coastal Systems
  → A basis for scenario projection and decision making

FUTURE SCENARIOS

COASTAL PROCESSES IN A CHANGING CLIMATE

- Projection of meteo-oceanographic processes under severe (RCP8.5) climate change conditions
- "Surrogate climate change" ocean-atmosphere modelling
- Multi-decadal wave and ocean circulation simulations
- High-resolution hydrodynamic modelling in transitional environments





- Morphodynamics of coastal alluvial systems
- Risk assessment for climate change impacts
- Tools for ecological projections

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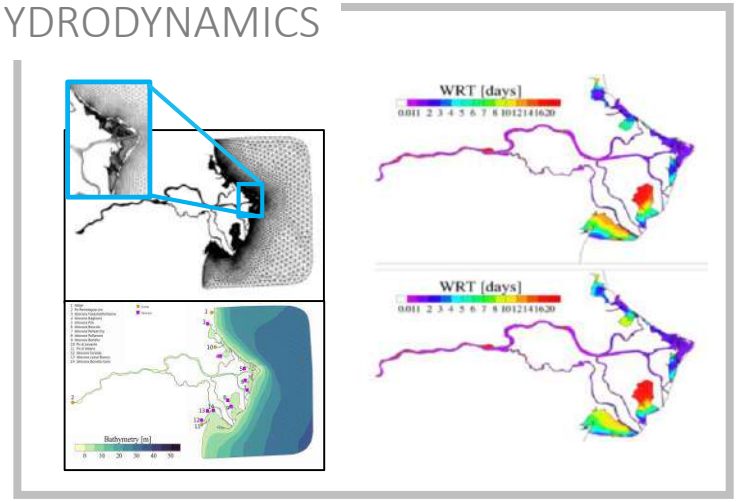
FUTURE SCENARIOS

MULTIDISCIPLINARY APPROACHES…

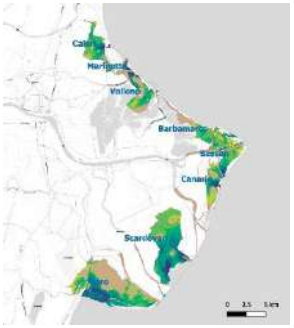
HYDRODYNAMICS



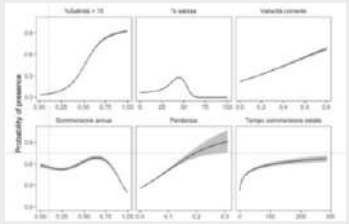
Environmental parameters

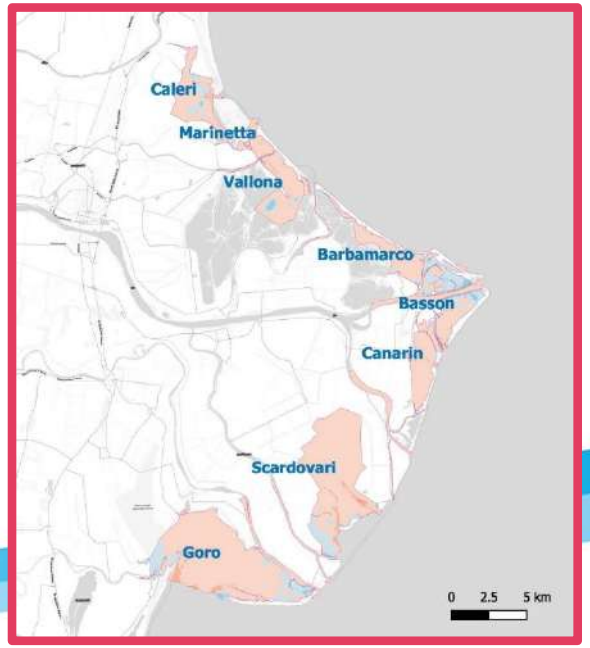
Present Future

Potential distribution



Habitat Suitability Model





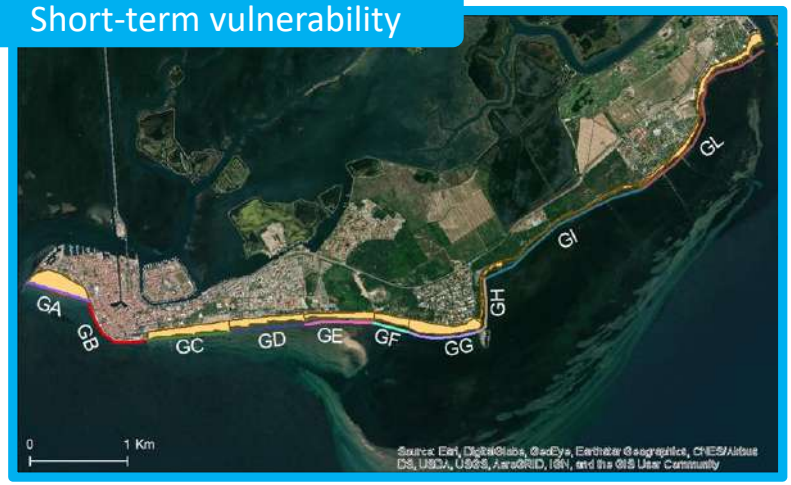
Present Future

Distribution data

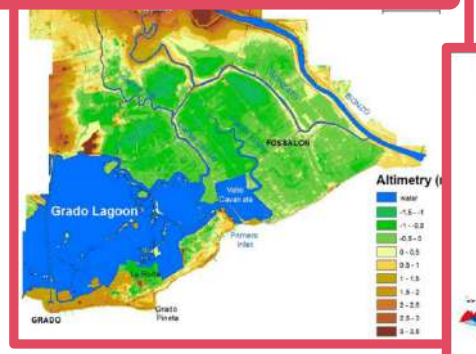
FUTURE SCENARIOS

…AND SHARED STRATEGIES: TOWARD A COORDINATED MANAGEMENT

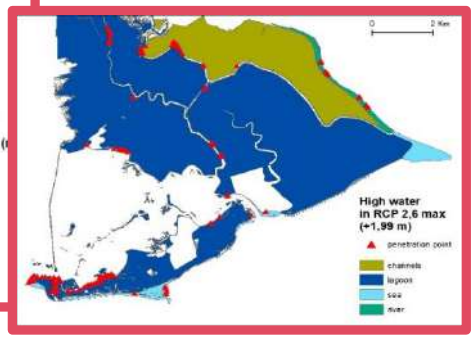
Short-term vulnerability

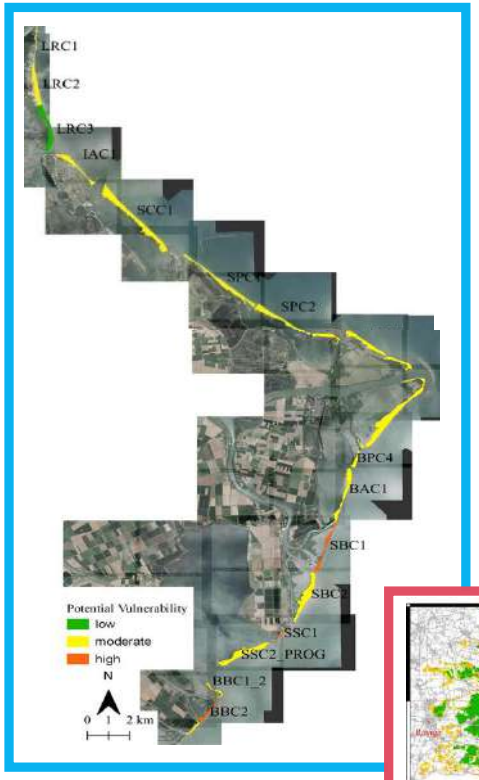


Long-term vulnerability



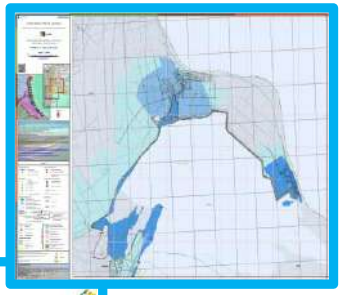
Banco della Mula di Muggia (Friuli Venezia Giulia)





Delta del Po (Veneto)

Delta del Po (Emilia Romagna)



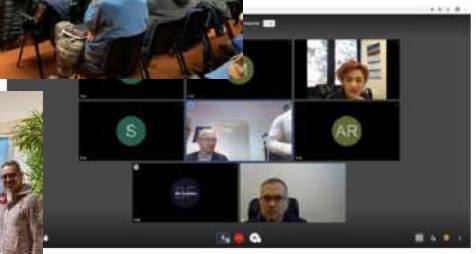
SHARING, INVOLVING, PROPOSING, CAPITALISING

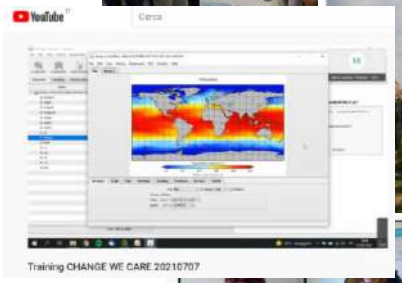
Info-days…

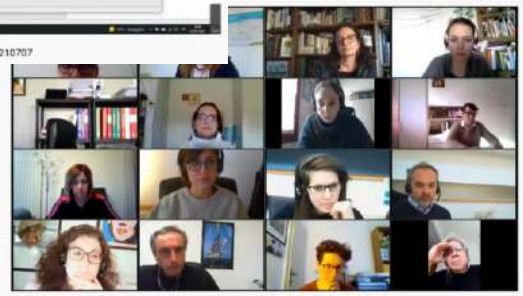
Conferences, web meetings, newlestters…

Training on use of data…

Participatory workshops







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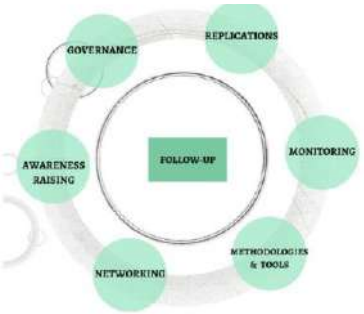
Interreg Life

Joint Action Plan



- Share data, tools, methodologies
- Coordinate ongoing activities and plan the upcoming steps
- Enhance the synergy among science, planning and policyne

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THANK YOU FOR YOUR ATTENTION

CNR-ISMAR
Davide Bonaldo

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www.ismar.cnr.it
www.italy-croatia.eu/web/changewecare

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Adaptation plan for the Jadro River Pilot Area

CHANGE WE CARE | Faculty of civil engineering, architecture and geodesy| Martina Baučić

Final Conference | On-line| November 11th, 2021.

European Regional Development Fund

Introduction

Adaptation plan for the Jadro River Pilot Area

- FGAG, University of Split - plan developer, main author: Jure Margeta, co-authors: Ana Grgić, Hrvoje Bartulović, Frane Gilić i Martina Baučić
- RERA Agency for Development of Split-Dalmatia County - coordinator
- contracted: January 2021, planned completion: November 2021.

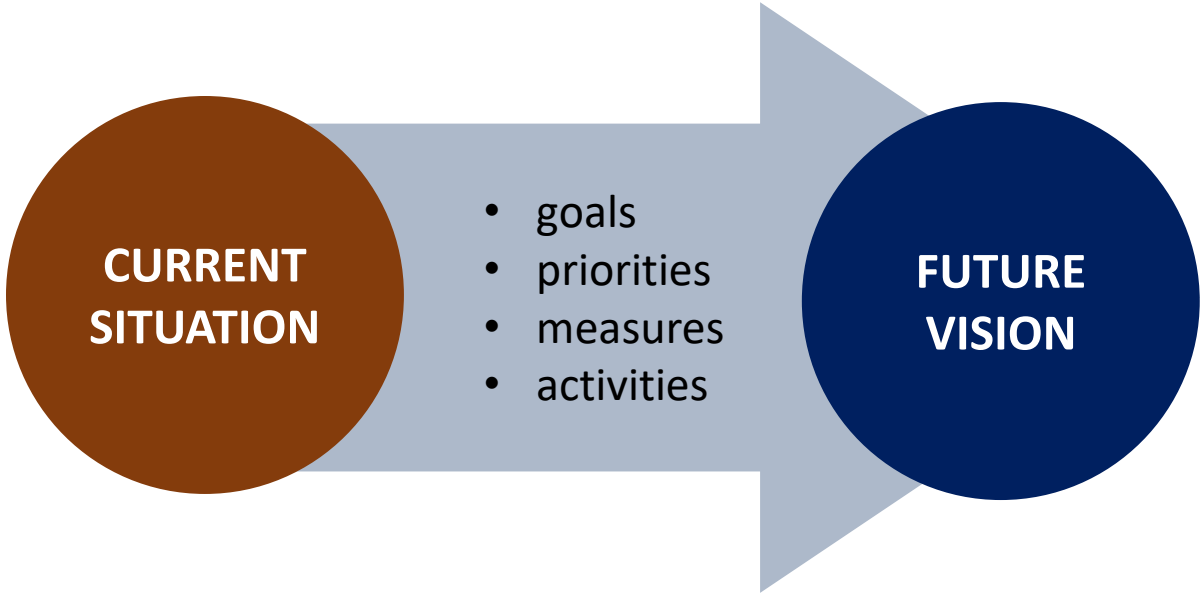
Activities:

- Workshop 1: Impact of climate change on the Jadro river area (June 2021)
- Workshop 2: Adaptation/Measures Scenarios (October 2021)
- Workshop 3: Presentation of the Action Plan (November 2021)

Introduction

Objective: **to provide a basis for decision-making in the management of the Jadro River area**

Participatory approach: **expert presentations + discussion + written comments**



CURRENT SITUATION

1. The current state of waters and the dangers of climate change

Jure Margeta, Ph.D. Professor Emeritus, FGAG

2. The current state of urbanization and the dangers of excessive urbanization

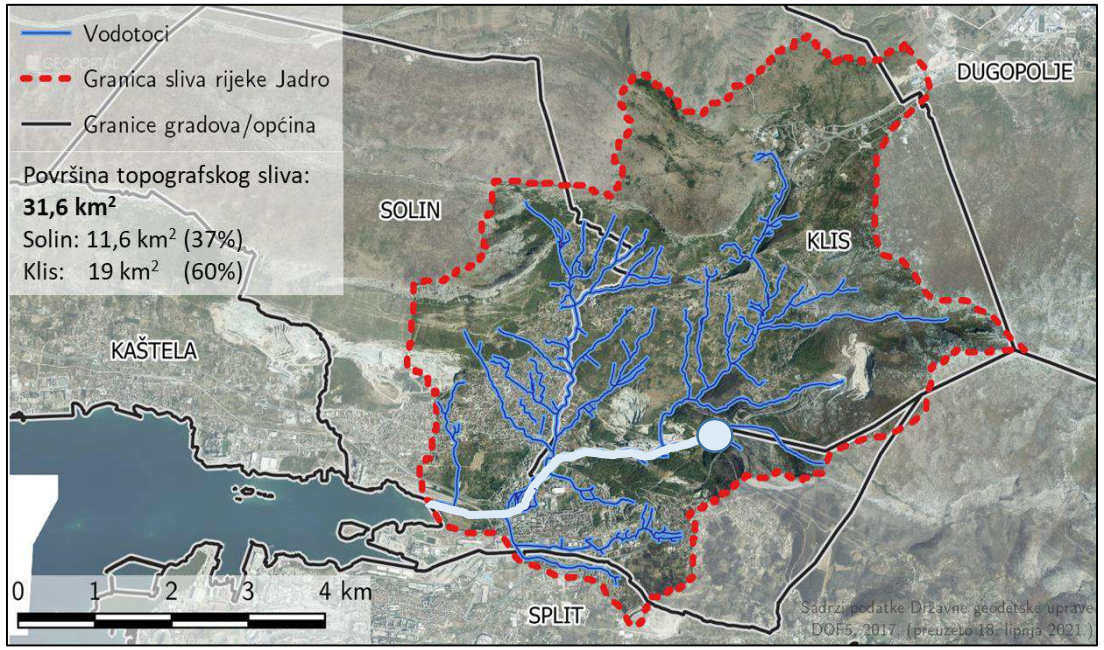
Ana Grgić, Ph.D., Hrvoje Bartulović, Ph.D. Martina Baučić, Ph.D., Frane Gilić FGAG

Conclusion: *"All the problems that have occurred so far related to the environment, water and biodiversity are the result of natural processes, climate and human activities related to land use and conversion in the Jadro River Basin, hydrological and topographic and the river itself and its tributaries. This will be the case in the future in the new uncertain and more complex climatic and socio-economic conditions of living and working in this area.* ***Therefore, the strengthening and resilience of biodiversity and thus the sustainability of life should be addressed through innovative spatial planning that respects the environment, and especially the waters that are sensitive and specific (karst) in these areas.*** *" (Jure Margeta)*

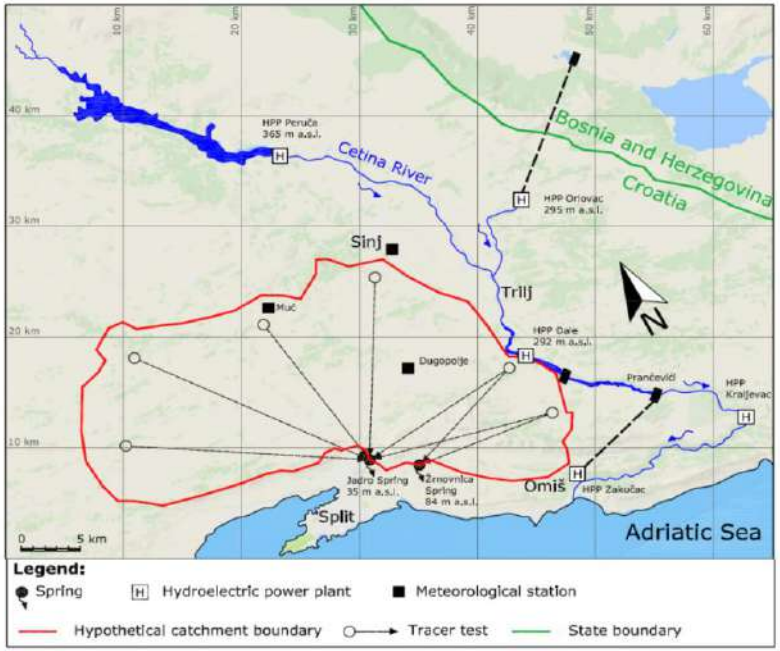
Basin areas

The main course of the river Jadro - cca 4,4 km

Topographic catchement - 28 km²



Hydrological catchment - 450 km²



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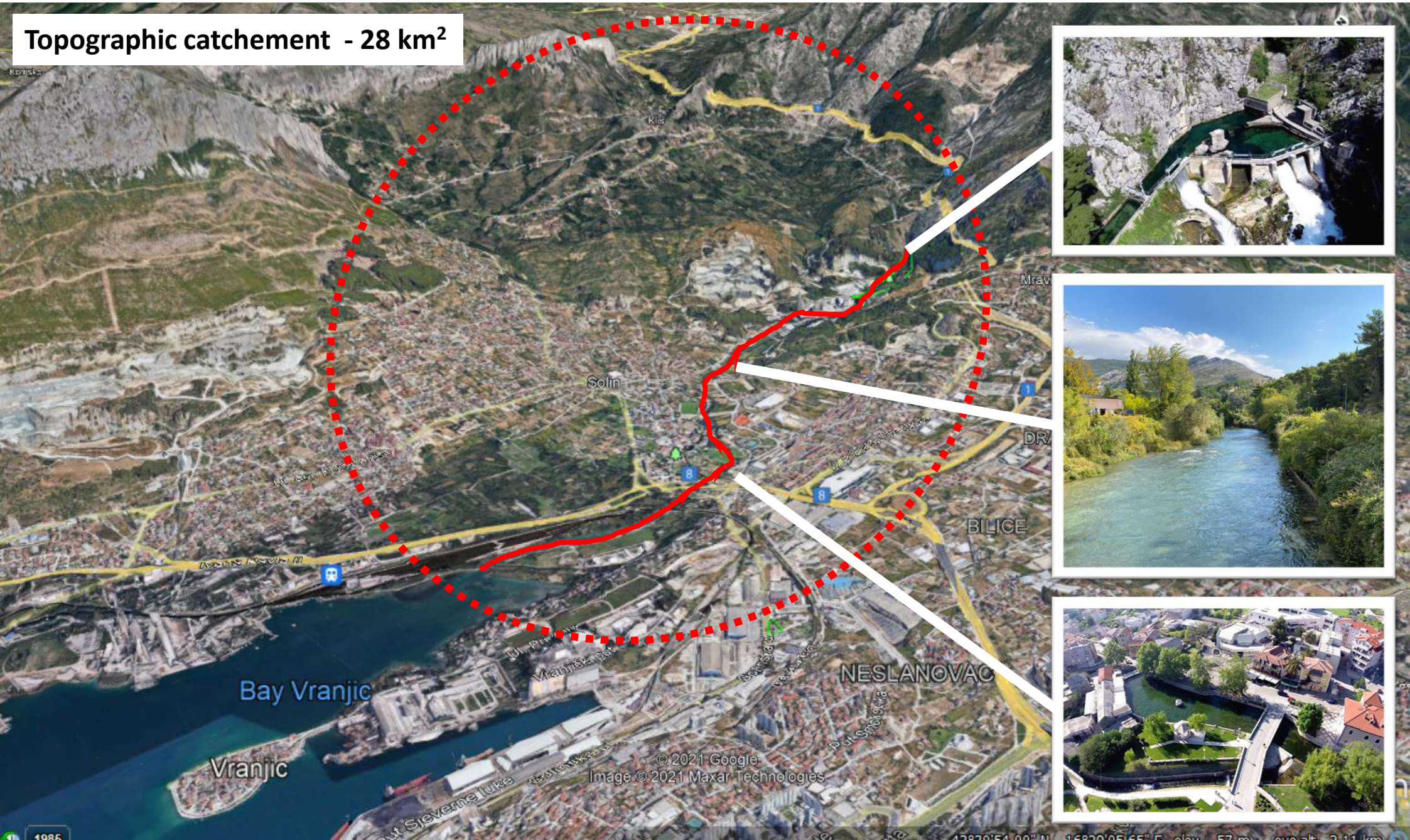
rerasd

Topographic catchement - 28 km²



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The main course of the river Jadro

Photo by Frane Gilić, 2021.

Basin areas

The main course of the river Jadro

- the strongest impact of urbanization
- the regulation / construction of the natural coast - destruction of the natural environment and biodiversity
- an increased risk of coastal flooding (caused by climate change)

Topographic basin of the river Jadro with main tributaries / torrents

- urbanized zones without sewage systems with treatment and without stormwater drainage
- wild fires (more likely due to climate change) - loss of vegetation and biodiversity - soil erosion - increases sediment transport
- increased rainfall in winter - increase the volume of water in surface runoff through urban space - pollution of the river
- poor water quality along the Jadro River from source to sea

Estuary flooding

Basin areas

Hydrological basin of the river Jadro

- a trend of urbanization and industrialization - affects the waters in the basin
- the **quantitative regime** of water is most influenced **by climate change**
- the regime of **water quality** is most influenced **by man** and his activities in the wider basin.
- water at the source - the main source of drinking water for the wider urban area of approximately 200,000 permanent residents

The hydrological basin of the river Jadro is still insufficiently explored and as such is complex to manage and must be viewed holistically respecting all processes: anthropogenic and natural.

Management problems

Objective: An integrated approach to water resources management

- **Forming teams** / bodies composed of water and environmental management experts, water and utility companies, spatial planners, etc. with the aim of **overcoming the growing challenges posed by climate uncertainty** regarding the sustainability of water resources, environment and living.
- Team work on **implementing green infrastructure** for better rainwater management, greater water reuse on site and construction of more green buildings to reduce drinking water demand, better water management within buildings and within urban areas, and conserving water-dependent water and ecosystem biodiversity .
- The work of teams on **the implementation of measures for forecasting water demand** and water conservation measures, and in general on new development projects. One example of such cooperation should be this project and its outcome Action Plan.

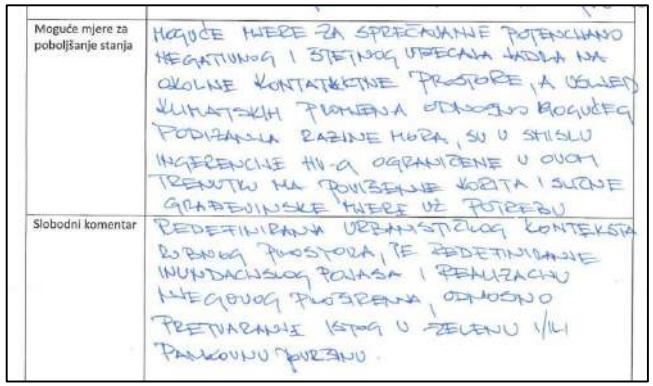
CURRENT SITUATION

Discussion and findings by stakeholders

Threats:

- Pressure for “urbanization” in all areas of the river basin but also in agriculture fields (asphalting of roads, surfaces…);
- Potential problems of water pollution due to highway impact;
- During summer the amount of water in the river Jadro is below the set biological minimum;
- Uncontrolled "use" of the river (waste disposal, fishing?);
- Rain and urbanism are the main drivers of water quality degradation;
- Tributaries/torrents are serving more and more as storm water drainage from urban areas (polluted waters) and also place for garbage disposal.

CURRENT SITUATION



Moguće mjere za poboljšanje stanja	MOGUĆE MJERE ZA SPREČAVANJE POTENCIJALNO NEGATIVNOG I ŠTETNOG UTJECAJA VODA NA OKOLNE KONTAKTNE PROSTORE, A UZLED KLIMATSKIH PROMJENA OTVORENO MOGUĆEG PODIZANJA RAZINE MORA, SU U SMISLU INTERVENCIJE HE-a OGRANIČENE U OVOM TRENUTKU NA PROŠIRENJE KORITA I SUHE GRAĐEVINSKE MJERE UŽ POTREBU
Slobodni komentar	REDEFINIRANJA URBANISTIČKOG KONTEKSTA RUBNOG PROSTORA, TE REDEFINIRANJE INUNDACIJSKOG POJASA I REALIZACIJU NEGOVOG PROŠIRENJA, ODNOSNO PRETVARANJE BETONA U ZELENU I/ILI PARKOVNU POVRŠINU.

Discussion and findings by stakeholders

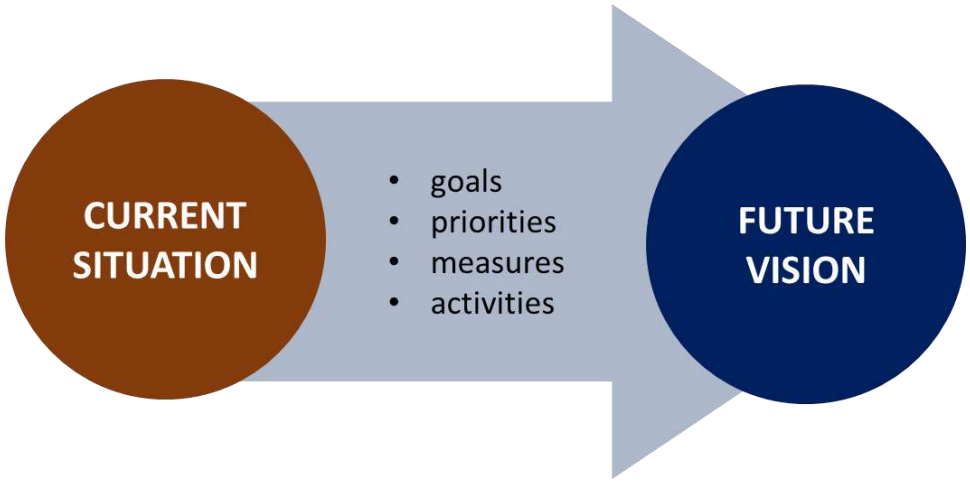
Measures:

- Necessity for one institution that will take care of the river Jadro and its basin (goal: to unite the efforts of Solin, Klis and competent companies and institutions, to achive integral approach for river management);
- Urbanization - need for control: built on site versus built permit;
- Jadro as main source of drinking water for the whole agglomeration: the need for an investigation for alternative source;
- Development of sanitary and storm water drainage system with water treatment and purification for all the settlement in the basin;
- Development of new construction specifications and national laws for systems based on “green infrastructure” concept (to allow development of green infrastructure, e.g. for parking areas);
- Development of plans for green infrastructure and implementing green infrastructure features in spatial plans.

FUTURE VISION

Preservation and improvement of the quality of life in the area of the river Jadro:

- **through the preservation and improvement of water and the natural environment,**
- **strengthening the resilience of built-up areas to climate change and**
- **the implementation of smart management of the Jadro River Basin and urban area.**

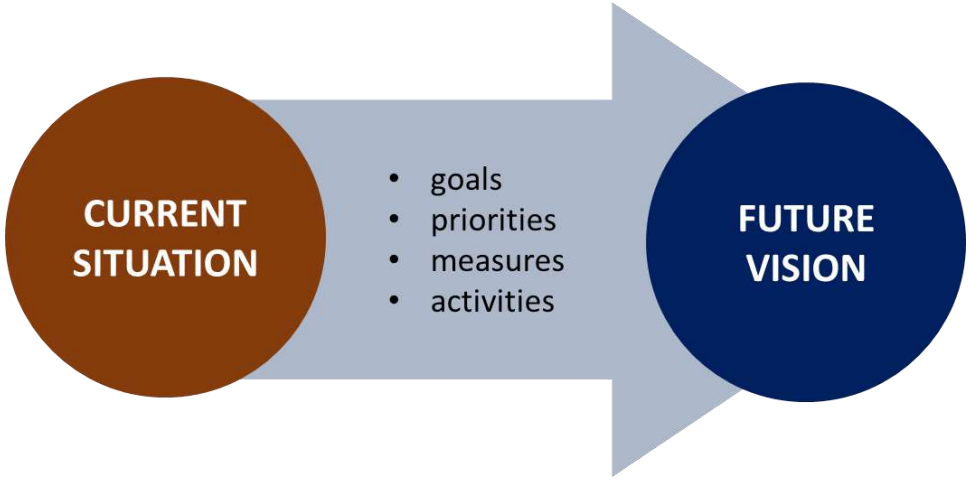


Goal 1: Preservation and improvement of water and natural environment

Goal 2: Strengthening the resilience of built-up areas to climate change

Goal 3: Implementation of smart management of the Jadro river basin

Goal 4: Implement smart urban management



Transforming settlements and the built environment in the Jadro river basin from **"hard and gray" to "soft and green"** in order to strengthen the sustainability and resilience of water resources, biodiversity, and human existence.

Strategies - concepts that are intended to be used in this project are:

- Protection of water resources through smart growth and development
- Development and growth with little impact on the environment or green infrastructure
- Design in a natural urban system or environmentally sustainable development
- Water sensitive urban design

Goal 1: Preservation and improvement of water and natural environment

The main course of the river Jadro

Concept: Design of a natural urban system

Measure: Protection of natural resources, biodiversity and endemic species of the river Jadro (**restoration of natural functions of the river Jadro**)

Photo by Frane Gilić, 2021.

Goal 1: Preservation and improvement of water and natural environment

Topographic basin of the river Jadro with main tributaries / torrents

Concept: Protect the environment and water through smart growth and development
Concept: Urban design sensitive to water
Concept: Development and growth with low environmental impact

Measure: **Preservation of natural tributaries / torrents of the river Jadro**

Measure: Determination of zones suitable for **renaturalization of tributaries / torrents of the river Jadro**

Measure: Construction of **storm sewer with treatment**

- Incorporate **a green-blue infrastructure** development
- control of the functioning of already built systems

Photo by Frane Gilić, 2021.

Goal 1: Preservation and improvement of water and natural environment

Topographic basin of the river Jadro with main tributaries / torrents

Measure: **Strengthen fire protection activities** and the capacity of fire protection forces

Measure: **Afforestation** of observed areas, restoration of biocenosis and biodiversity, strengthening of resistance to soil erosion

https://www.24sata.hr/news/veliki-pozar-pokraj-solina-gori-borova-suma-zatvorena-cesta-535305

Goal 1: Preservation and improvement of water and natural environment

Hydrological basin of the river Jadro

Concept: Protect the environment and water through smart growth and development
Concept: Integrated water resources management

- Measure: **Protection against water pollution of the basin by wastewater**
- Measure: Protection against water pollution of the basin **by waste**
- Measure: Protection against water pollution of watersheds **from roads** by applying green and other solutions, and afforestation of buffer zones along roads in order to reduce soil pollution along roads
- Measure: Protection against water pollution of the basin by filtering through the exploitation fields of raw materials (**open pits and plants**)
- Measure: Redefining the provisions for construction in the area of the hydrological basin
- Measure: Establishment of a system for monitoring aquifer capacity in the basin and the impact of climate change

Goal 2: Strengthening the resilience of built-up areas to climate change

The main course of the river Jadro

Concept: Design of a natural urban system

Measure: **Creating a "green-blue heart" of the city of Solin**

Measure: In the area of transitional waters and estuaries - improving protection against rising sea, river and groundwater levels by using **"natural solutions"** while enabling smart, environmentally sustainable development of that part of the city

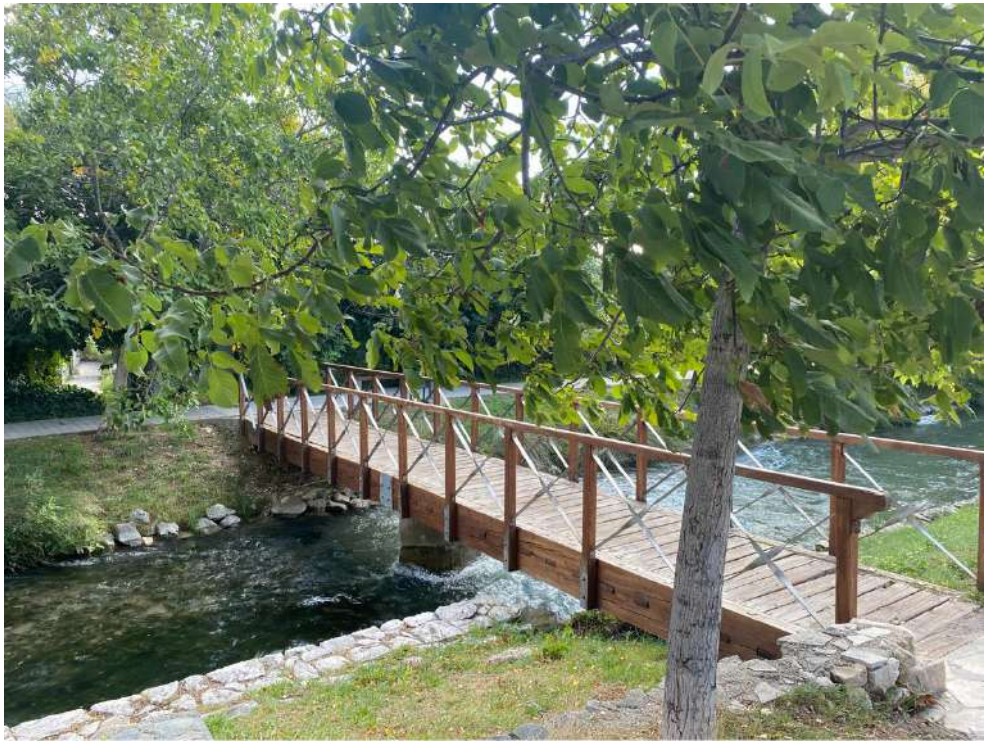


Photo by Frane Gilić, 2021.

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Design: Loci
Project Location: Finland
Typology: Flood Resilience / Parks / Wetland /
Built: 2014
Involved manufacturers:
Published on September 8, 2020

Jadro river estuary flooding

?

nature based solution
(green and not gray solution)

Goal 2: Strengthening the resilience of built-up areas to climate change

The main course of the river Jadro

Measure: **Distance from shallow coastal zones**, zones of high probability of flooding

Measure: **Slowing down the water flow** and expanding the water flow to larger areas

Measure: Relocation and redesign of vital urban infrastructure from high-risk areas

Measure: **Creation of a protective natural buffer zone** along riverbeds and tributaries, and planting of trees and other greenery

Photo by Frane Gilić, 2021.

Goal 2: Strengthening the resilience of built-up areas to climate change

The main course of the river Jadro

Measure: **Protection of cultural and historical heritage along the river Jadro from flooding** caused by the raising of the river, groundwater and rainwater

Measure: Protection of the densely urbanized area of the city of Solin from harmful influences coming to the lower zones of the city and the river Jadro from the higher zones, which occur by rinsing the terrain during heavy rains and overflowing septic tanks or sewage.

Photo by Frane Gilić, 2021.

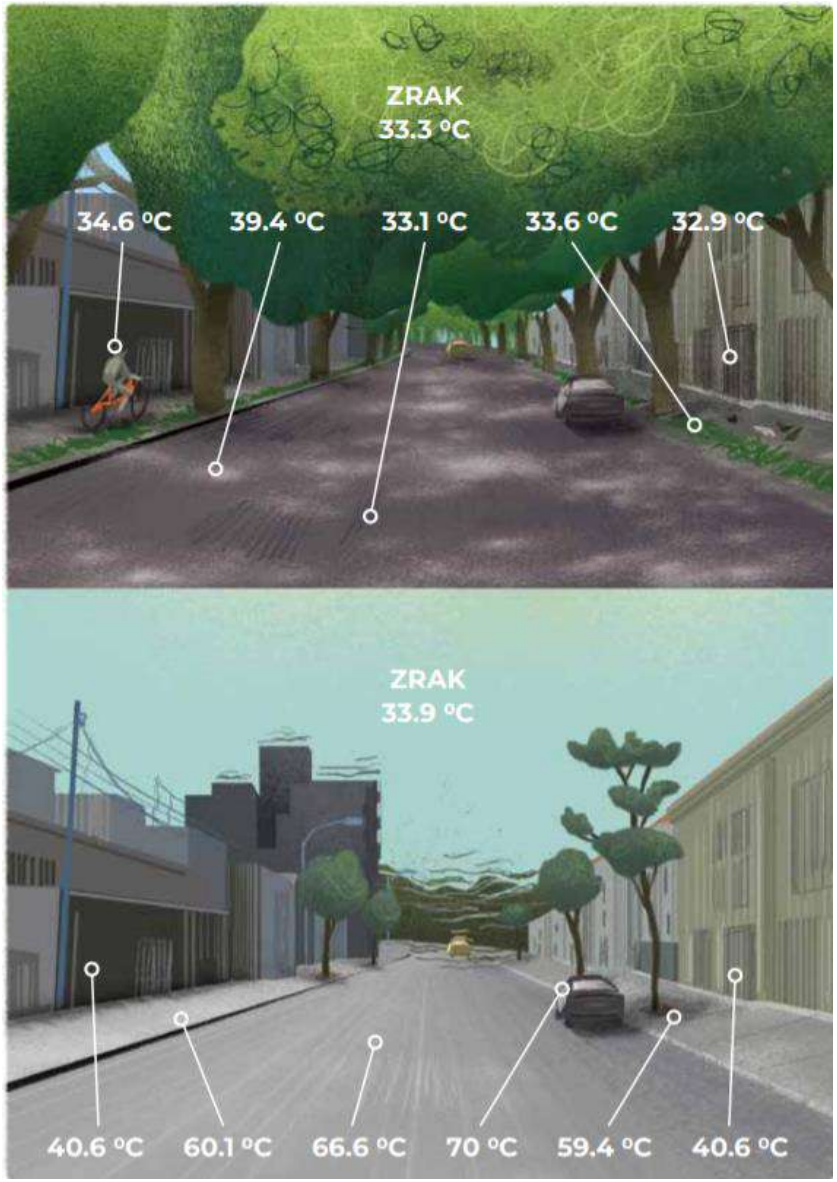
Goal 2: Strengthening the resilience of built-up areas to climate change

Topographic basin of the river Jadro with main tributaries / torrents

Concept: Protect the environment and water through smart growth and development
Concept: Urban design sensitive to water
Concept: Development and growth with low environmental impact - environmentally sustainable development

Measure: **Protection against flooding by rainwater** by applying water-sensitive urban design
Measure: **Protection against soil erosion** by water using standard methods as well as urban design sensitive to water
Measure: **Reduction of heat waves** by applying green infrastructure and planting trees (planting trees in urban areas along pedestrian corridors, around public institutions, in parking lots, around buildings… ..)

https://adriadapt.eu/wp-content/uploads/2021/06/Sto-mogu-gradonacelnici.pdf



Goal 3: Implementation of smart management of the Jadro river basin

Concept: Integrated water resources management

Measure 1: **Implement the commitments already made** defined in the water management plans in accordance with the implementation of the Water Framework Directive.

Measure 2: **Establish a Coordination Committee with representatives of competent ministries, counties, cities and municipalities, managers of national resources** (Croatian Waters, Croatian Forests, Sea and Karst), scientific institutions (IZOR, University H, HHI) with the aim of implementing measures from this Plan (application of projects and their implementation from EU and national funds - "go green, go digital"), and relevant plans implemented in accordance with European water and environmental policy.

Measure 3: **Establish an agency / company for project implementation in the catchment area and application for further projects (after obtaining a larger projec**t)

Goal 3: Implementation of smart management of the Jadro river basin

Measure 4: **Monitor the development and introduce innovative tools** in planning, implementation and monitoring of the situation in the area of the river Jadro

Measure 5: **Strengthen knowledge about the needs of integrated and comprehensive management of the Jadro River** Basin and the need for water protection and adaptation to climate change (importance of waste and wastewater management in the basin, importance of preserving natural hydrological processes - through leakage, advantages of green-blue infrastructure…)

Measure 6: **Analyze possible local specific policies** that strengthen water protection and, most importantly, adopt provisions for their strict implementation.

Measure 7: **Coordination with the public and all stakeholders**

Goal 4: Implement smart urban management

Concept: Development and growth with little impact on the environment or green infrastructure
Concept: Design in a natural urban system or environmentally sustainable development

Measure 1: **Realize the already assumed obligations that are defined in the spatial management plans**

Measure 2: **Monitor the development and introduce innovative tools** in the planning, implementation and monitoring of urban areas

- examine the possibilities and propose a methodology for planning and monitoring through free data of the EU Copernicus program and others (eg use permit versus built in the field)
- examine the possibility and propose a methodology for incorporating the measures and objectives from this Plan into legally prescribed management documents (eg spatial plans)
- propose new paradigms in urban governance in the context of climate change

Measure 3: **Strengthen the knowledge of all stakeholders** on the need to include climate adaptation measures in urban management

Measure 4: **Coordination with the public and all stakeholders**

Thanks for your attention.

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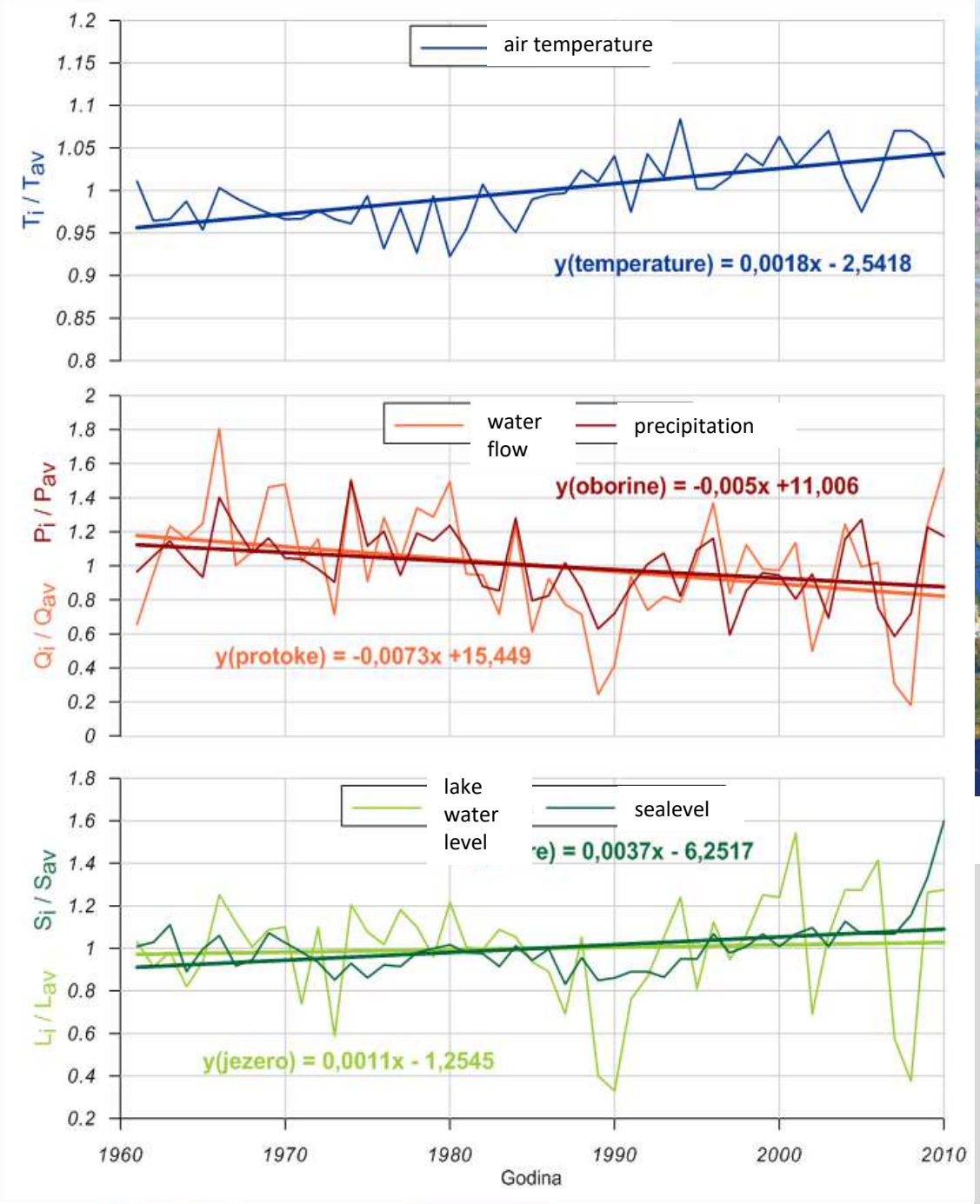
Vransko lake and climate change adaptation - how to regenerate to adapt?

CHANGE WE CARE | Vransko lake Nature Park| Norma Fressel

Final Conference | On-line| November 11th, 2021.

European Regional Development Fund



Challenges addressed by the Project

- Sea level rise
- Rise in air temperature
- Reduced water inflows from the basin
- Increase in nutrient concentration and decrease in water quality
- Biodiversity loss and habitat loss

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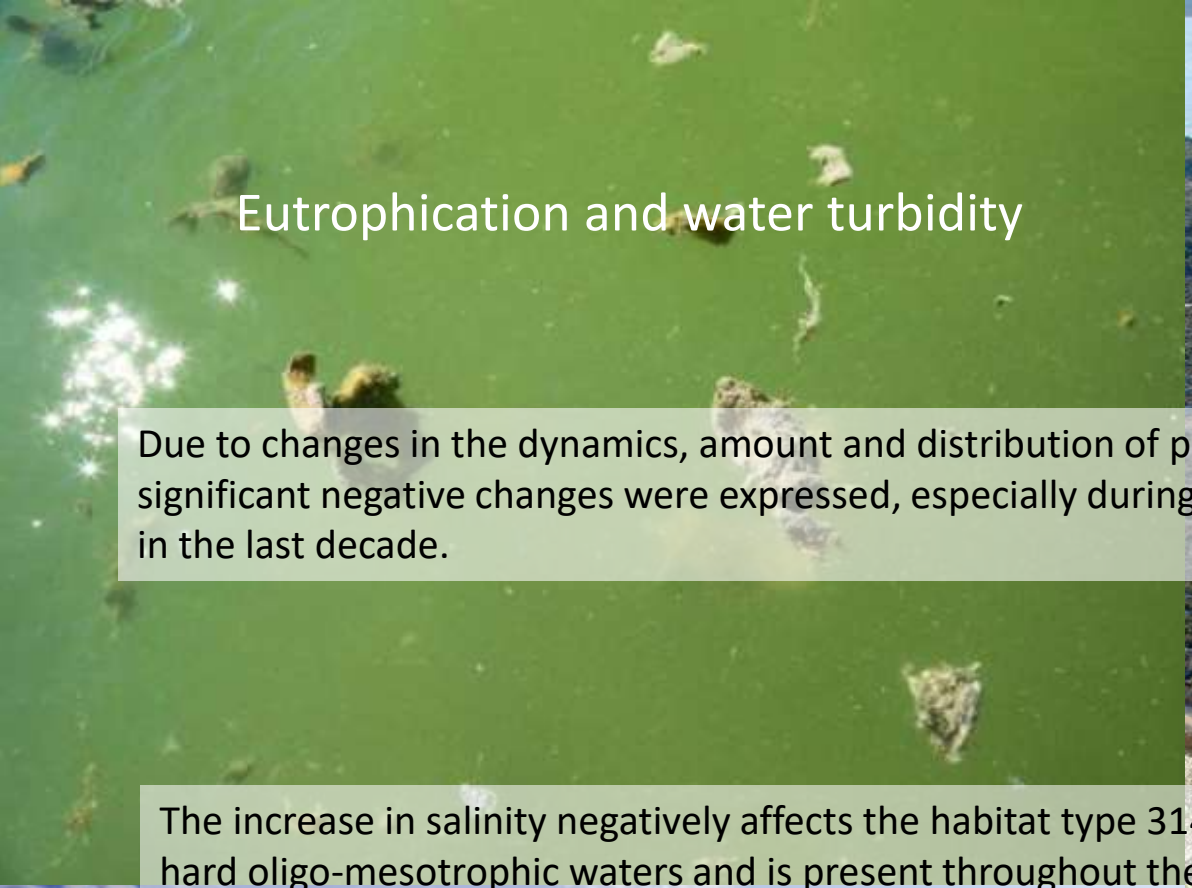
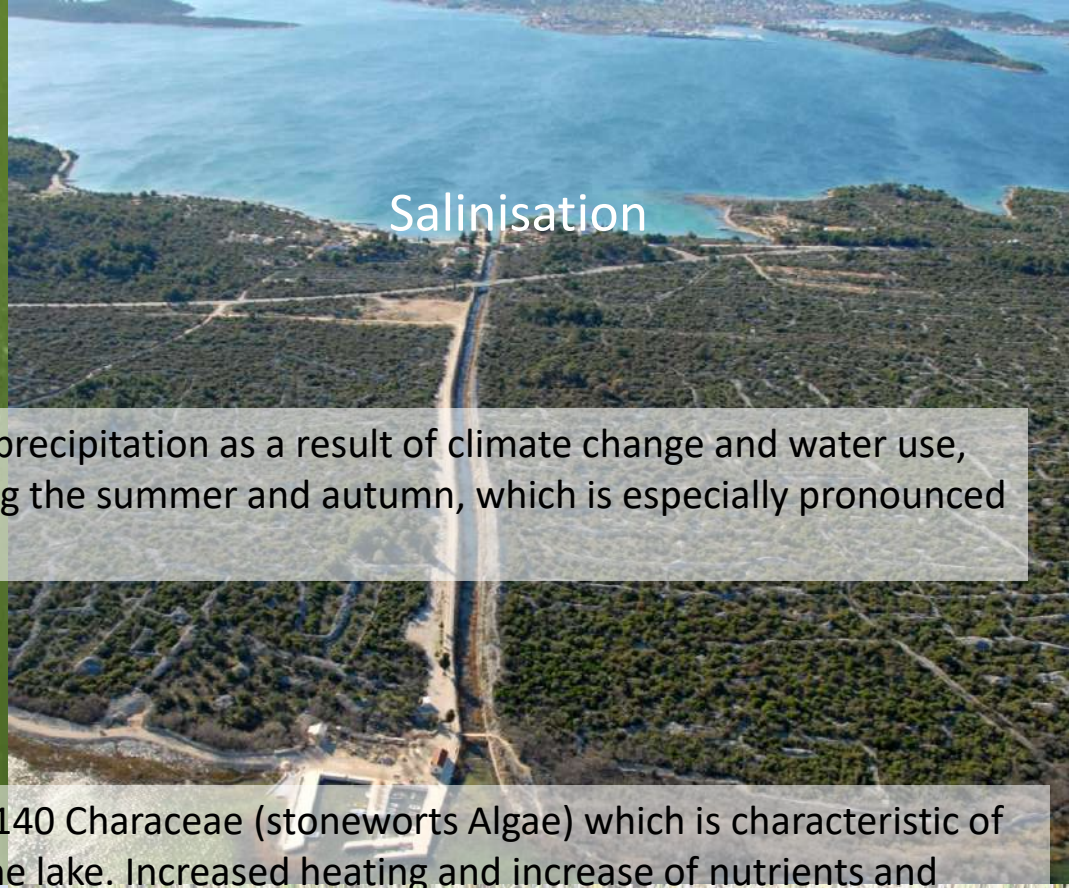


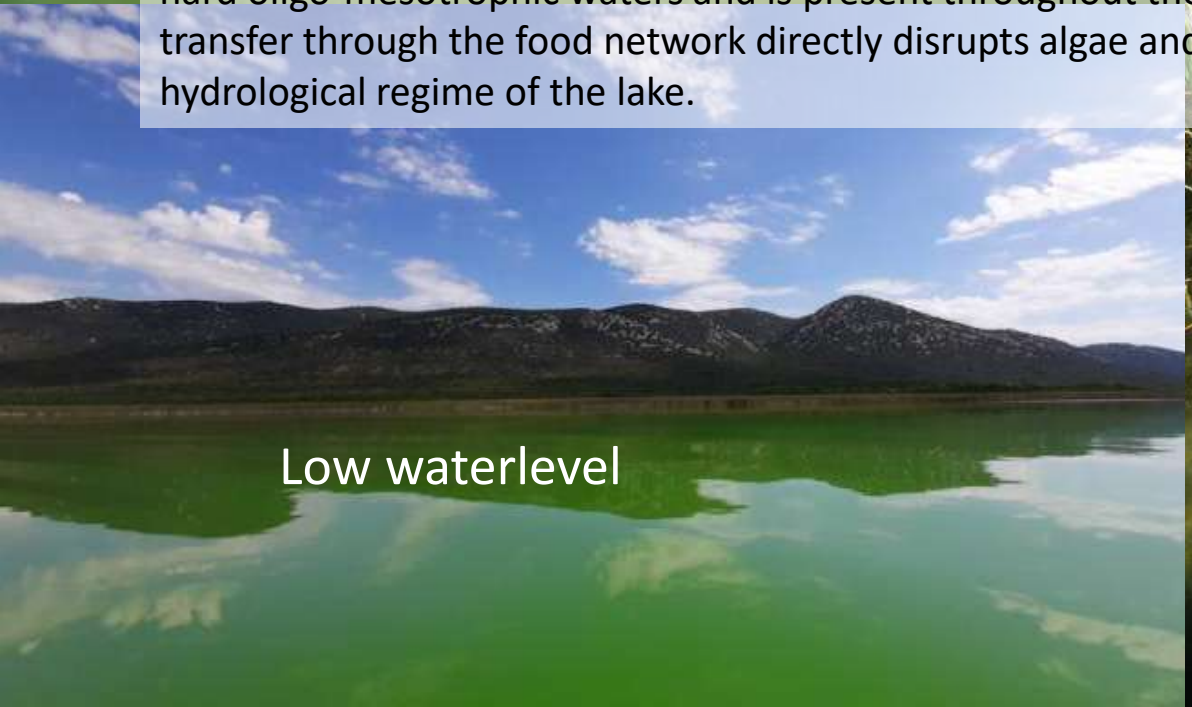
Eutrophication and water turbidity



Salinisation

Due to changes in the dynamics, amount and distribution of precipitation as a result of climate change and water use, significant negative changes were expressed, especially during the summer and autumn, which is especially pronounced in the last decade.

The increase in salinity negatively affects the habitat type 3140 Characeae (stoneworts Algae) which is characteristic of hard oligo-mesotrophic waters and is present throughout the lake. Increased heating and increase of nutrients and transfer through the food network directly disrupts algae and affects other species that are related to the favorable hydrological regime of the lake.



Low waterlevel

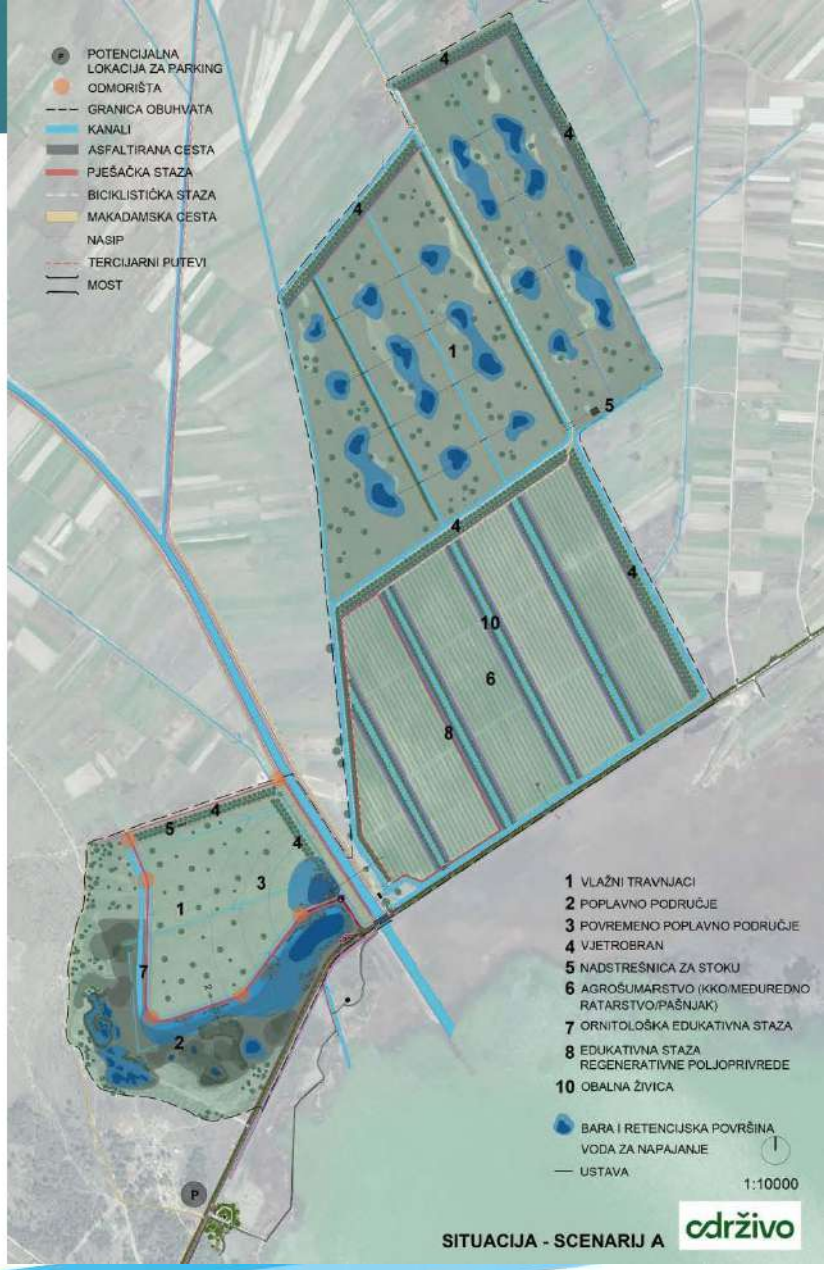
Loss of biodiversity

Adaptation plan participatory process

The adaptation options emerging from the participatory processes

Raising awareness and capacity building to adapt and mitigate the effects of climate change	Organization of lectures, seminars, round tables, study trips	Production of educational materials and raising public awareness	Scientific research activities
Preservation of wetland habitats, ensuring good water management and favorable water regime	interedisciplinary holistic biodiversity/trophic and water and sediment quality monitoring	Ensuring ecological minimum during irrigation implementation	Salinisation and eutrophicatio prevention with technical solutions
Advocating, creating and strengthening partnerships for climate change adaptation	Organization of meetings and informal meetings	Lobbying and implementation of public advocacy campaigns	Organization of meetings and expert guides for journalists and partners
Implement Pilot actions on carbon farming and flooded meadows restoration	Resolving competencies at the level of planning documentation and property-legal relations	Detailed analysis of carbon content in soil, geodesic measurments and hidrological conditions	Selection of custom restorative/regenerative measures
Promoting and marketing of local agricultural products	Legalisation of agriculture products	Fairs and markets organisation	Organization of meetings and focus groups with farmers

Scenarij A – minimalna intervencija



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Scenarij A – minimalna intervencija

» Međuredno ratarstvo/travnjaštvo

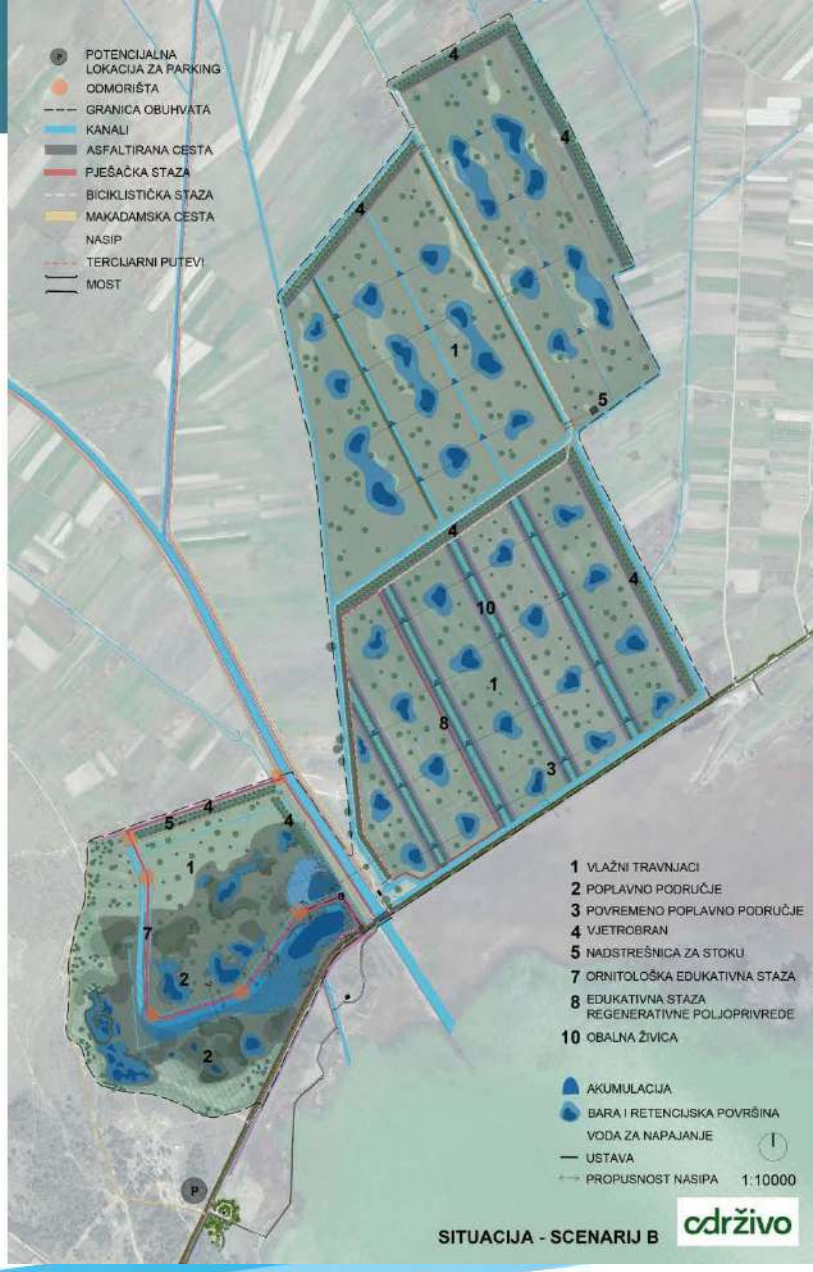
- Između redova KKO → povrće, ratarski usjevi i krmno bilje/ispaša
- Usjevi za prodaju i/ili hranidbu stoke izvan perioda ispaše vlažnih livada
- Povrće → višegodišnji visokovrijedni usjevi → **šparoge, artičoke**
- Krmno bilje za ispašu ili košenje (sijeno, sjenaža) → **DTS**
- Ratarski usjevi → **pšenica, tritikal, ječam, raž, uljana repica, lucerna**

» Kulture kratkih ophodnji (KKO)

- Vrba i/ili topola u dvoredima u rotaciji od 3-5 g.
- Biomasa za energiju, stanište za korisne i zaštićene životinjske vrste, vjetrobran, hlad za stočne životinje na ispaši

Presjek

Scenarij B – umjereno poplavljivanje



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Scenarij B – umjereno poplavljivanje

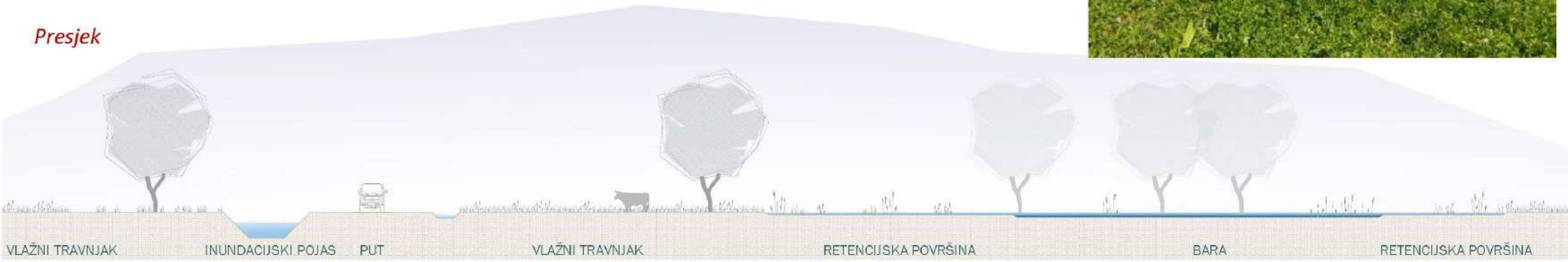
» **Stočarstvo i travnjaštvo vlažnih livada**
- Isto kao u scenariju A → ispaša 5 mjeseci + štalski uzgoj → telad, janjad, ždrjebad

» **Kulture kratkih ophodnji (KKO)**
- Isto kao u scenariju A → vrba i/ili topola za sječku

» **Živice i cvjetne trake**
- Isto kao u scenariju A → vjetrobrani, obalne živice uz kanale i cvjetne trake

» **Međuredno travnjaštvo**
- Između redova KKO → ispaša i košenje sijena za zimsku hranidbu stoke ili prodaju

Presjek



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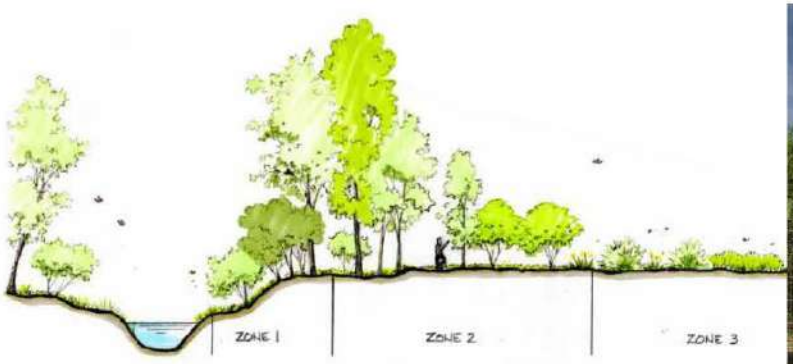
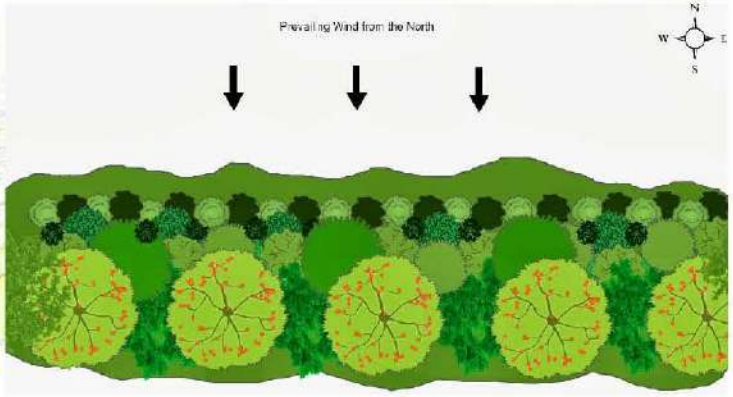
Naslov





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Scenarij C – poplavljivanje uz podizanje podzemnih voda

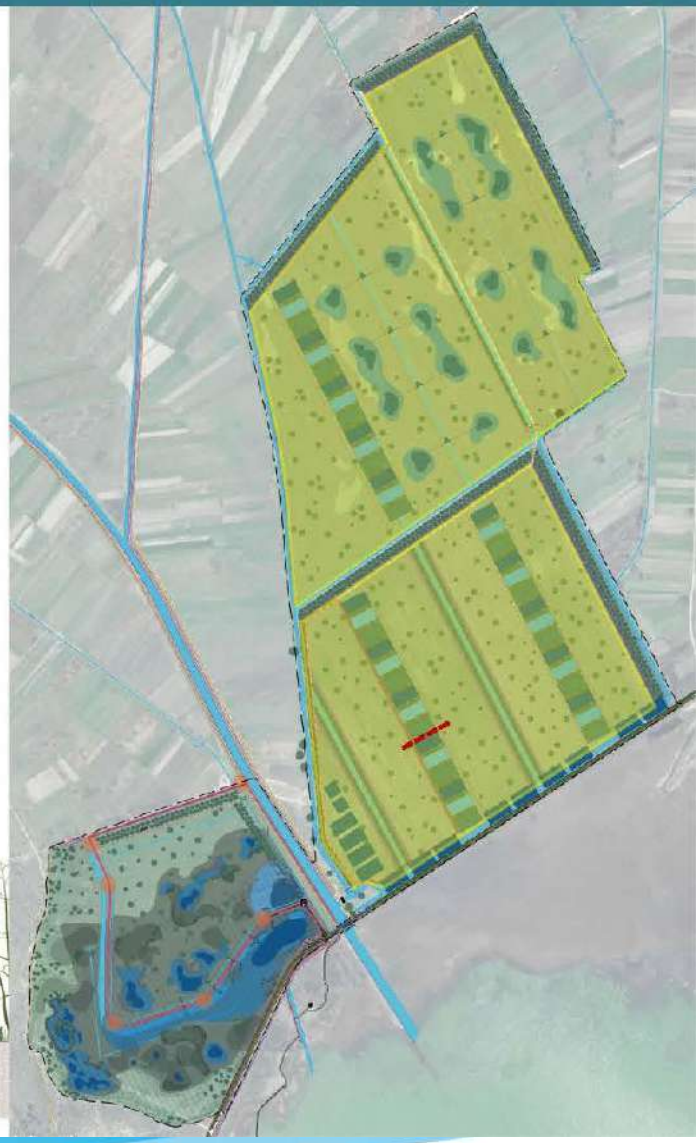
» **Stočarstvo i travnjaštvo vlažnih livada**
- Isto kao u scenarijima A i B → ispaša 5 mjeseci + štalski uzgoj → telad, janjad, ždrjebad

» **Kulture kratkih ophodnji (KKO)/paludikultura**
- Isto kao u scenarijima A i B → vrba i/ili topola za sječku
- Ukoliko nema suhog razdoblja za sakupljanje biomase, nije moguć uzgoj vrbe i topole (trska?)

» **Živice i cvjetne trake**
- Isto kao u scenarijima A i B → vjetrobrani, obalne živice uz kanale i cvjetne trake

» **Međuredno travnjaštvo**
- Između redova KKO/ribnjaka → ispaša i košenje sijena za zimsku hranidbu stoke ili prodaju lokalnim stočarima

» **Akvakultura**
- Ovisno o kvaliteti vode → potencijal za slatkovodnu ili bočatu akvakulturu
- Uzgoj primjerenih vrsta **riba, algi, biljaka, mekušaca i rakova** u ribnjacima
- Punjenje i protok vode iz drenažnih kanala i kanala Stari Jablan
- Prodaja akvakulturnih proizvoda, hranidba stoke i/ili riba, ribolovni turizam



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Thank you for your attention

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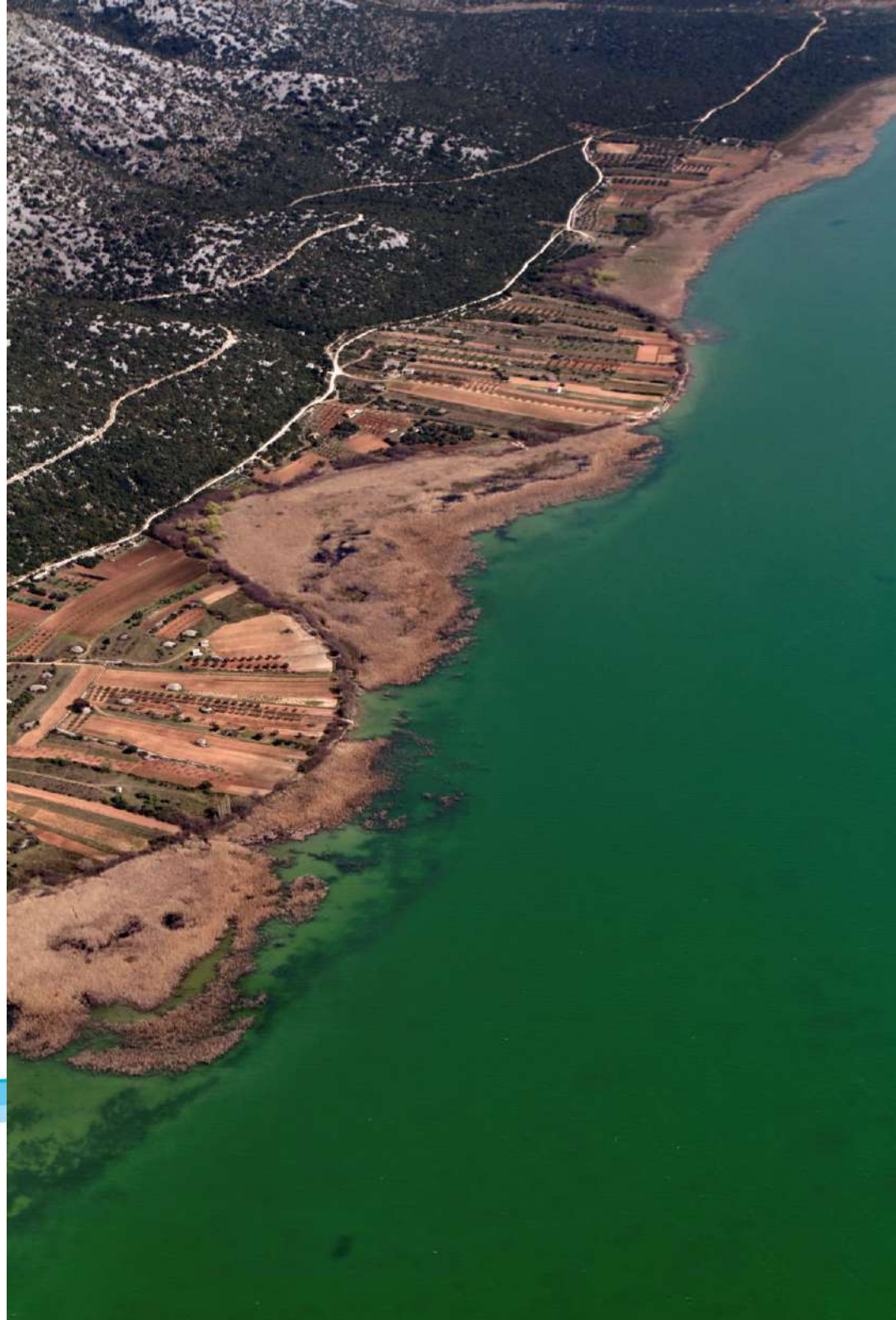

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ADAPTATION PLAN FOR NERETVA RIVER DELTA

-

Participatory process & key conclusions

CHANGE WE CARE | PIDNC| Paola Marinović, *external expert*

Final Conference | On-line| November 11th, 2021

European Regional Development Fund

Content

1. **Description of the Pilot Area**
2. **Impact of the climate change**
3. **Participatory process & key conclusions**
   - 2.1. First workshop
   - 2.2. Second workshop
   - 2.3. Third workshop

3. Vision and goals

1. Description of the Pilot Area

- **The most valuable wetlands** on the eastern Adriatic coast
- **Densely populated** (>35 thousand people)
- **Ramsar site** since 1993.
- **Natura 2000:**
  - Special protection areas (SPA) HR1000031 Neretva Delta
  - Special areas of conservation (SAC) HR5000031 Neretva Delta
- **Protected areas in Croatia** (Nature Protection Act):
  - **six special reserves:**

Orepak, Modro oko i jezero Desne, Pod Gredom, Kuti i Prud and Neretva mouth

- **and one significant landscape:**

Predolac-Šibenica

Figure 1. Visual identity of the area – meliorated agricultural landscape

2. Impact of the climate change

Table 1. Impact of climate change on water resources, agriculture, fisheries and aquaculture and biodiversity

WATER RESOURCES	AGRICULTURE	FISHERIES AND AQUACULTURE	BIODIVERSITY
SEA LEVEL INCREASE AND SALINIZATION OF COASTAL HABITATS	CHANGE OF VEGETATION PERIOD OF ARABLE CROPS	ESTIMATED INCREASE IN THE TEMPREATURE OF ADRIATIC SEA WILL BE AROUND 1,6-2,4°C	DISAPPEARNACE AND FRAGMENTATION OF HABITATS
REDUCING THE AMOUNT OF WATER IN WATERCOURSES	LOWER YIELDS OF ALL CROPS AND GREATER NEED FOR WATER	MIGRATION OF MARINE ORGANISMS	LOSS OF ENDEMIC SPECIES
INCREASING THE FREQUENCY AND INTENSITY OF FLOODS	MORE FREQUENT FLOODS AND STAGNATION OF SURFACE WATER WILL REDUCE YIELDS	A GREATER NUMBER OF INVASIVE ALIEN SPECIES AND DISAPPEARANCE OF INDIGENOUS FISH SPECIES	SPREAD OF INVASIVE ALIEN SPECIES

3. Participatory process and key conclusions

- **Programme & stakeholders**
- **Key challenges**
- **Identified adaptation measure**

Figure 2. Workshop 2 in the City of Opuzen, August 2021

3. Participatory process and key conclusions
3.1. First workshop (Metković, March 2021)

- **'Effects of climate change on the Neretva delta'**
- **12 stakeholders**

Programme:

- Presentation of the **Preliminary document** and
- **Discussion** divided in four topics: water resources, agriculture, fisheries and aquaculture and biodiversity
- **Defining the vision** of the area

Key challenges:

- **The available quantities of water** coming to the Neretva delta
- An **increase in sea level**
- **Photo safari** recognized as potentially dangerous form of tourism

Adaptation measures proposed:

- **Educating local population** in adapting to climate change
- **Fostering organic agriculture**
- Need to address the problem of adaptation to climate change at **international level**

3. Participatory process and key conclusions
3.2. Second workshop (Opuzen, August 2021)

- **'Adaptation measures to different climatic scenarios for the delta Neretva'**
- **14 stakeholders**

Programme:

- Presentation of results of research - **Mapping of target fish species in the area of the ecological network Neretva Delta (HR5000031)**
- Presentation of results of research - **Research of the physico-chemical factors of climate change in the area of the Delta Neretva ecological network (HR5000031)**
- Presentation of **Adaptation measures to different climatic scenarios for Delta Neretva ecological network area**
- Workshop in which stakeholders needed to be actively involved in defining objectives, measures and activities for 4 key areas: water resources, agriculture, fisheries and aquaculture, and biodiversity.

Key challenges:

- **Conventional agriculture** has been recognized as the **main polluter of the area**

Adaptation measures proposed:

- The importance of **organised linking of stakeholders in agriculture** is emphasized
- Fostering the use of **renewable energy sources**

3. Participatory process and key conclusions
3.3. Third workshop (Ploče, Semptember 2021)

- **'Action Plan for adaptation to expected climate change in the Neretva delta'**
- **13 stakeholders**
- **Programme:**
  - Presentation of **Fishery and economic study of the area of the Delta Neretva ecological network**
  - Presentation of **Research of socio-economic status of main stakeholders in the fisheries sector in the area of the delta Neretva ecological network**
  - Presentation of **Action Plan for adaptation to climate change**
  - Participants invited to comment on each objective, measure and activity

Key challenges:

- Identified importance of the Action Plan being a publicly available document and **presented to key stakeholders in the area**
- **Inadequate waste management**

Adaptation measures proposed:

- In the context of sustainable water ecosystem management, the importance of **preventing illegal activities is emphasized**
- The **orientation of eel hunting into hunting for tourism purposes** has been recognized as a measure that can contribute to the reduction of the excessive eel fishing

4. Vision and goals

The vision of **'the symbiosis of river and people'** is planned to be realized through the following objectives:

1. **Preserved and adaptable ecosystem;**
2. **Sustainable management of aquatic ecosystems;**
3. **Improving the functionality of important ecosystems;**
4. **Sustainable and resilient economy and**
5. **Population awareness and proactivity**

Figure 3. Defining the vision of the area on the workshop 1

Thank you for your attention!

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Change We Care | Italy | Po Delta Park

On-line Final Conference, November 11th 2021

Towards the identification of climate change adaptation options for the Po River Delta

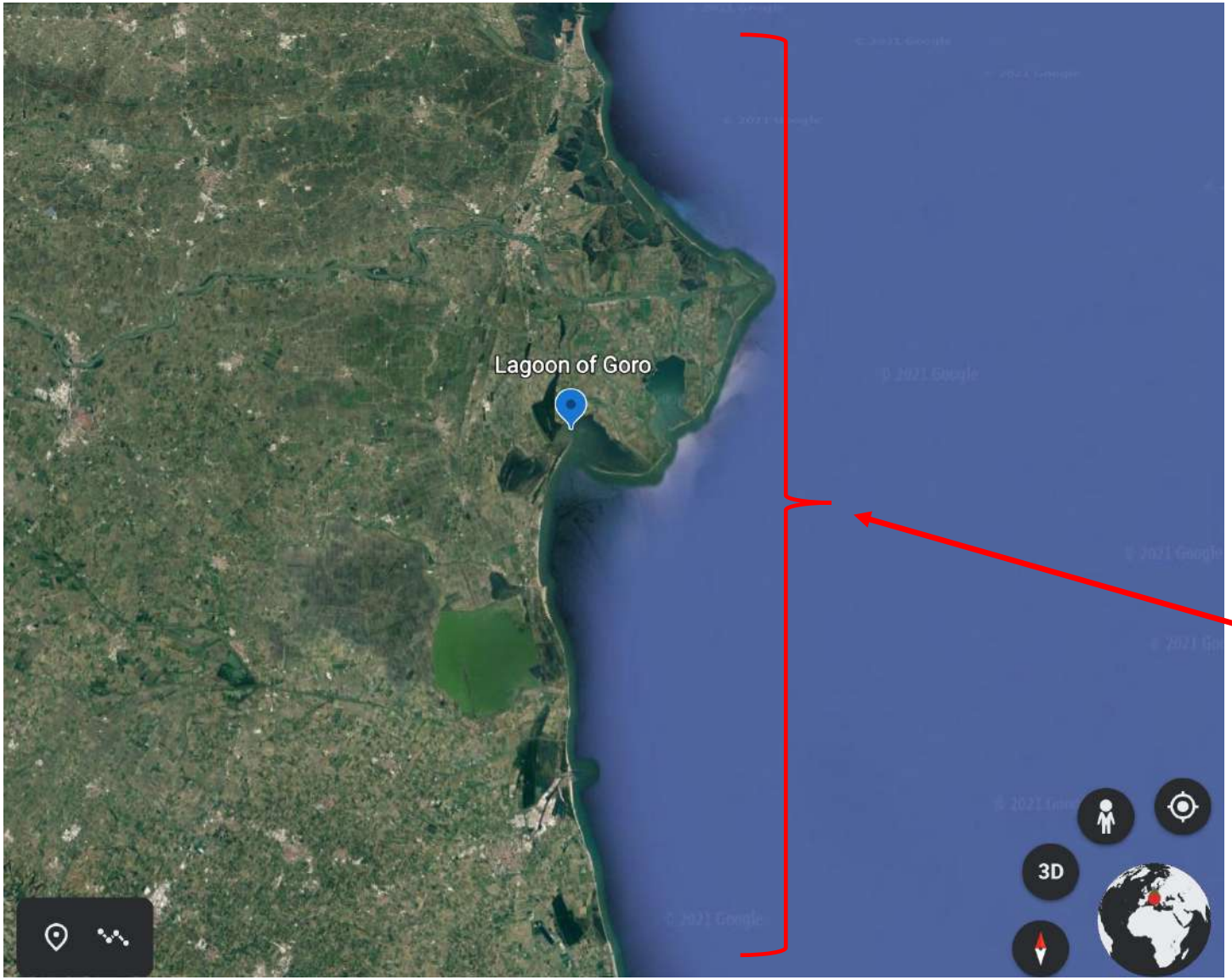
Giuseppe Castaldelli, University of Ferrara, Italy, ctg@unife.it

Maria Pia Pagliarusco, former Director of the Po Delta Park

Anna Gavioli, Francesco Goggi and Massimiliano Costa

Po Delta Park of the Emilia-Romagna, Italy

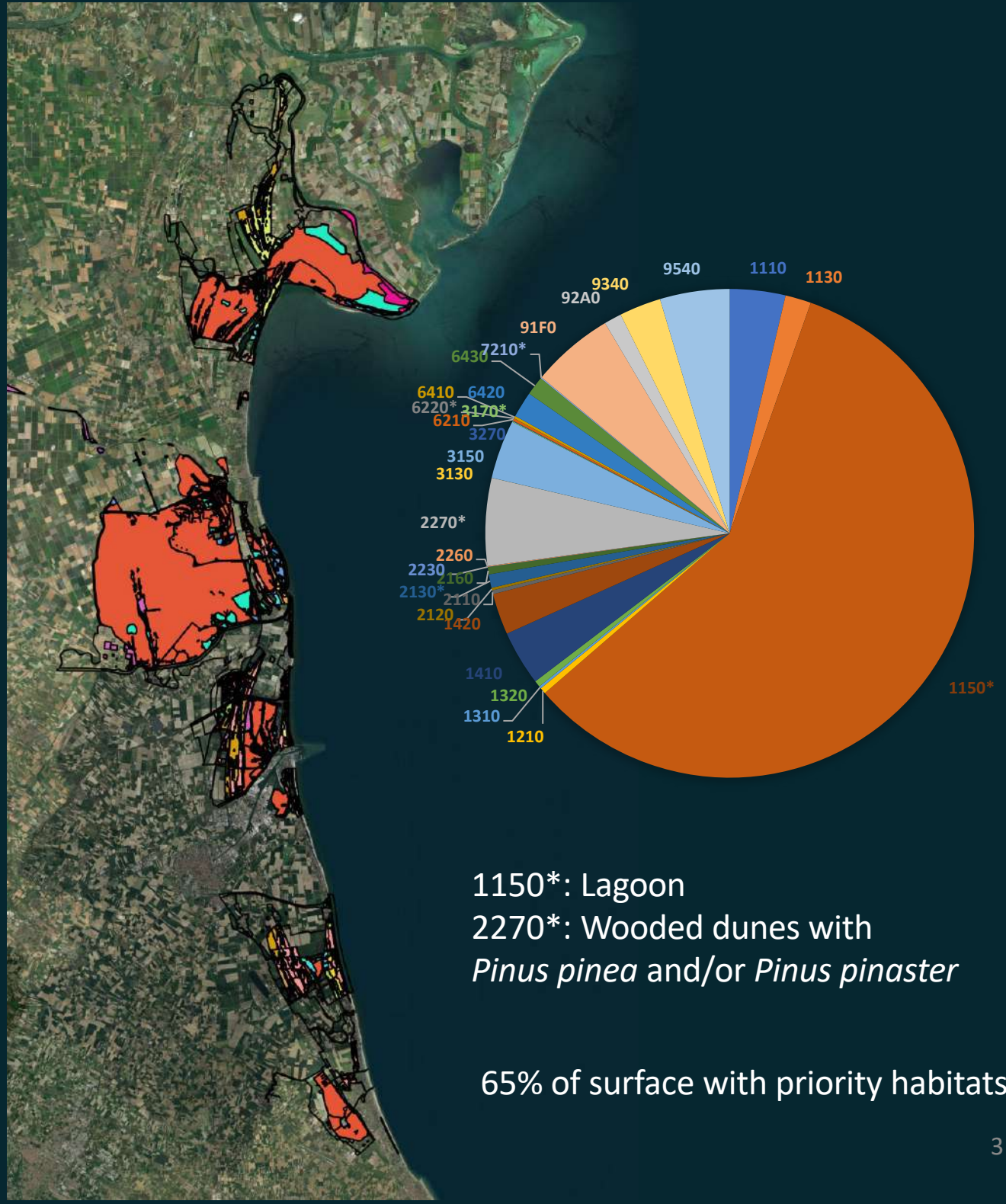
European Regional Development Fund


Lagoon of Goro
3D

While data on species distribution resulted missing or discontinuous habitats characterization was available and covers 13 years.

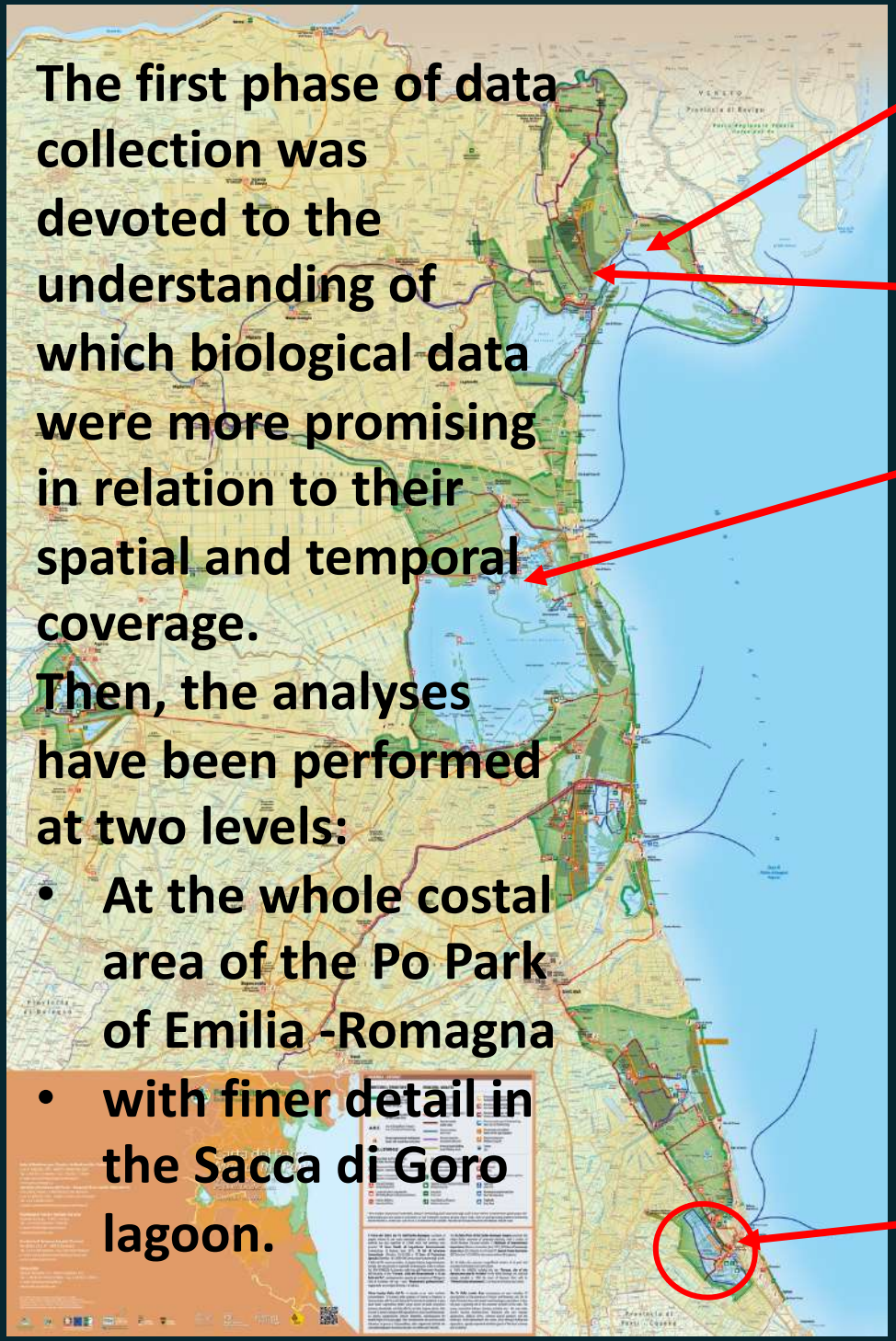
Overall, three habitat maps were already available for the whole coastal territory of the Park, in 2007, 2010 and 2014.

A new habitat map has been committed in 2019 by the Po Delta Park and is now concluded.



1150*: Lagoon
2270*: Wooded dunes with *Pinus pinea* and/or *Pinus pinaster*

65% of surface with priority habitats



The first phase of data collection was devoted to the understanding of which biological data were more promising in relation to their spatial and temporal coverage.
Then, the analyses have been performed at two levels:

- At the whole costal area of the Po Park of Emilia -Romagna
- with finer detail in the Sacca di Goro lagoon.

Goro lagoon: water quality, flora, birds and clam production

Mesola forest: flora

Comacchio lagoons: water quality, flora, fish, birds

water

MDPI

Article

Seasonal Variation of Functional Traits in the Fish Community in a Brackish Lagoon of the Po River Delta (Northern Italy)

Mattia Lanzoni, Mattias Gaglio *, Anna Gavioli, Elisa Anna Fano and Giuseppe Castaldelli

Aquatic vegetation loss and its implication on carbon cycle in a protected freshwater wetland

Gaglio M., Bresciani M., Muresan A.N., Lanzoni M., Vincenzi F., Fano E.A., Castaldelli G.

To be summitted to "Water" (ISSN 2073-4441)

Cervia saltworks: birds, fish fauna

In Emilia-Romagna, the lagoon of Goro, within the protected district of the Po Delta Park, Volano-Mesola-Goro, was chosen as study site.

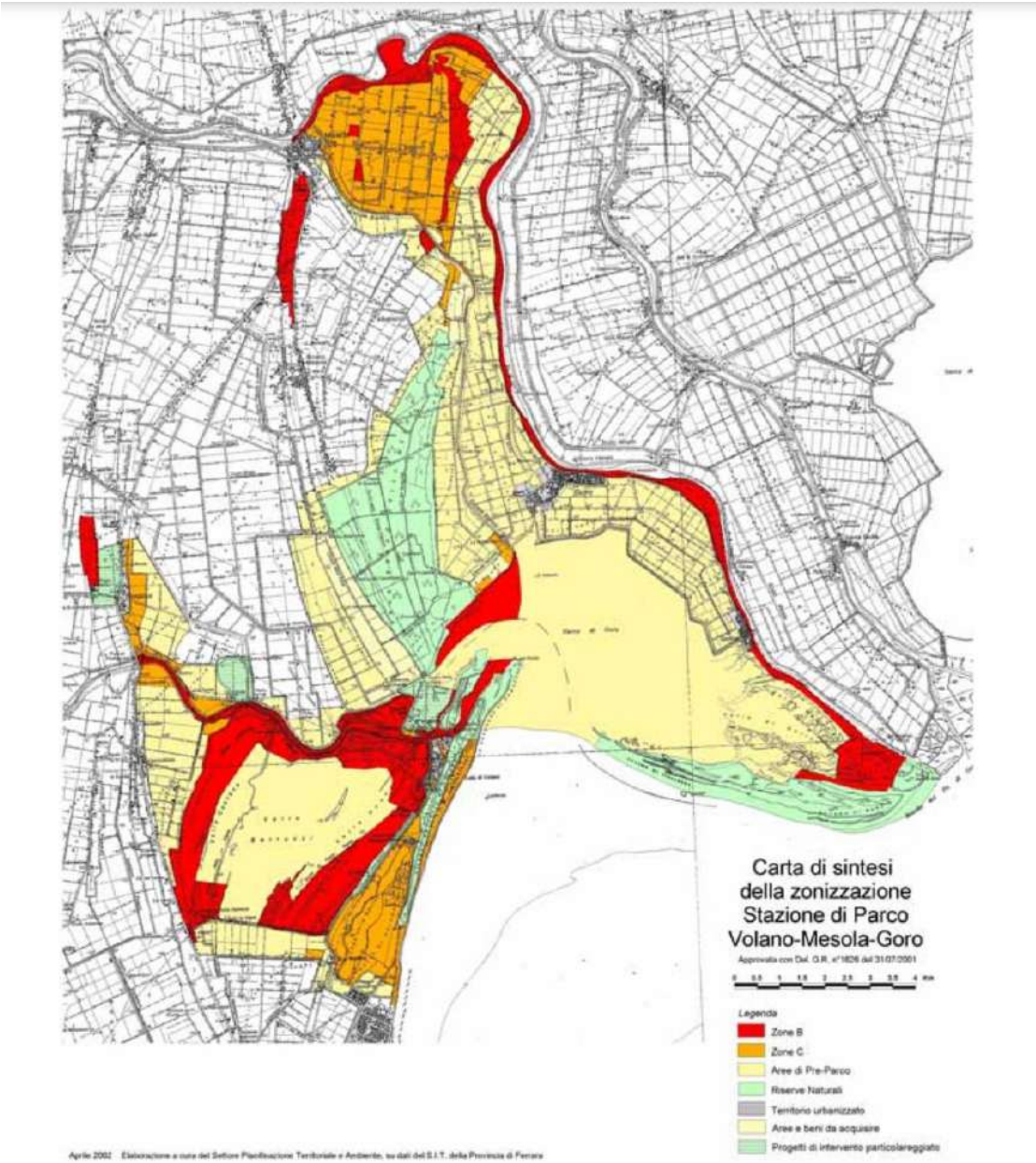
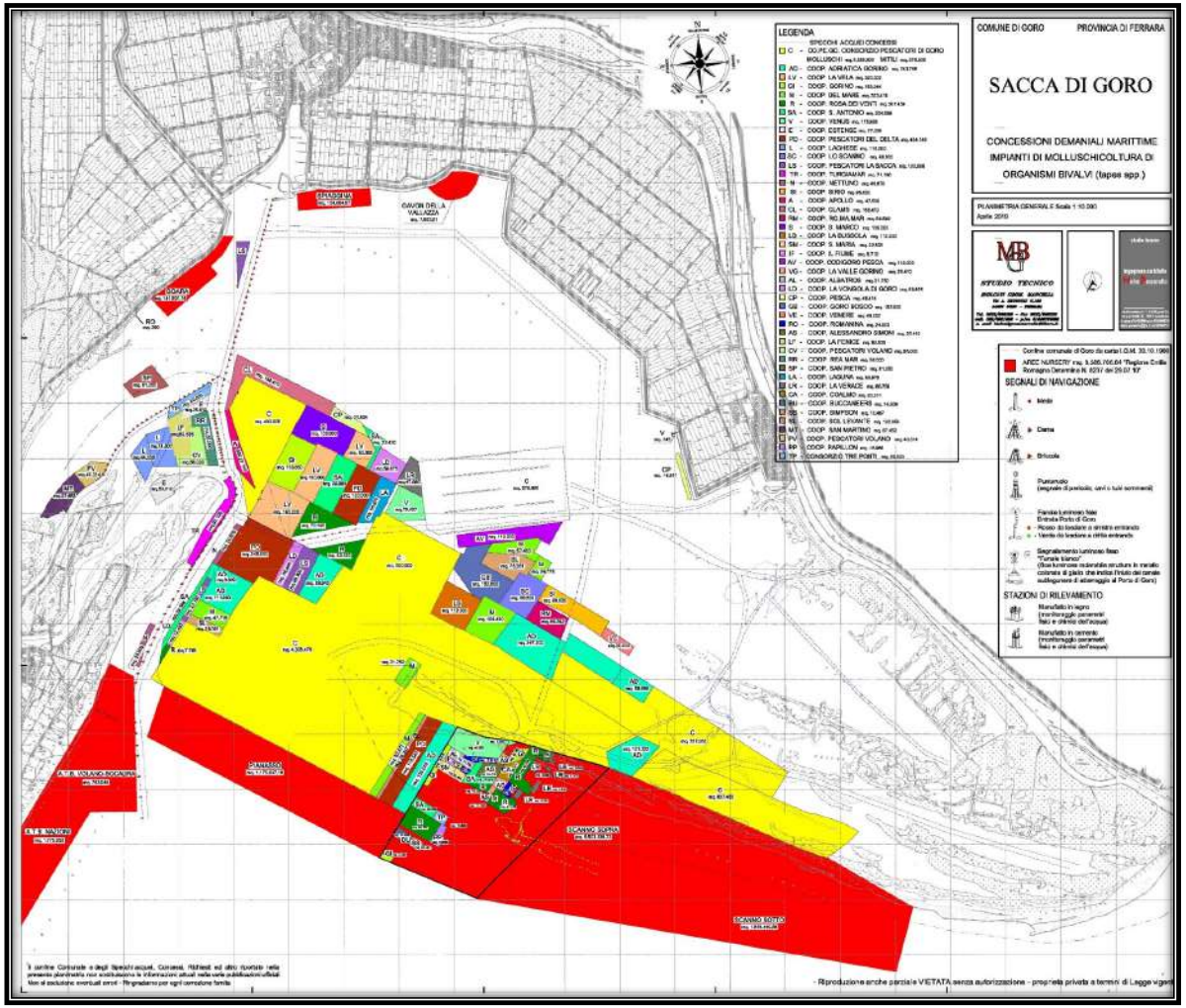


Fig. 3.1 - Carta di Sintesi della zonizzazione della Stazione di Parco Volano-Mesola-Goro

Center of this district is the lagoon of Goro, where the protection of nature matches with its sustainable exploitation for mollusc culture.



resources
MDPI

Article

Life Cycle Assessment of Oyster Farming in the Po Delta, Northern Italy

Elena Tamburini [1,*], Elisa Anna Fano [1], Giuseppe Castaldelli [1] and Edoardo Turolla [2]

sustainability
MDPI

Article

Sustainability of Mussel (*Mytilus Galloprovincialis*) Farming in the Po River Delta, Northern Italy, Based on a Life Cycle Assessment Approach

Elena Tamburini [1,*], Edoardo Turolla [2], Elisa Anna Fano [1] and Giuseppe Castaldelli [1]

sustainability
MDPI

Article

Life Cycle Assessment (LCA) Proves that Manila Clam Farming (*Ruditapes Philippinarum*) is a Fully Sustainable Aquaculture Practice and a Carbon Sink

Edoardo Turolla [1], Giuseppe Castaldelli [2], Elisa Anna Fano [2] and Elena Tamburini [2,*]

PARTICIPATORY PROCESS - ACTIVITY DETAILS 5.6.1

DONE

- **To inform and sensitize the stakeholders of the Sacca di Goro**
- To involve stakeholders in identifying the prevailing critical issues related to climate change
- To involve stakeholders in the definition of concrete actions (projects) to counter and mitigate the effects of climate change

4 GROUPS OF STAKEHOLDER

PUBLIC ENTITIES
AND COMPETENT AGENCIES

TOURISM OPERATORS
AND OTHERS ECONOMIC
OPERATORS

TEACHERS AND REPRESENTATIVES OF
ENVIRONMENTAL ASSOCIATIONS

AQUACULTURE PRODUCERS
AND FISHERMEN

3 WORKSHOP ORGANIZED

1° workshop: Municipality of Goro on 29 September 2020

2° workshop: on web on 24-25th November 2020

3° workshop: on web on 24-25th March 2021

WORKSHOP III The third workshop took place on web on 24-25th March 2021 in 2 phases:

- 24th March: Stakeholder groups took place separately at different time. 32 participants
- 25th March: The plenary session of third workshop. 31 participants .

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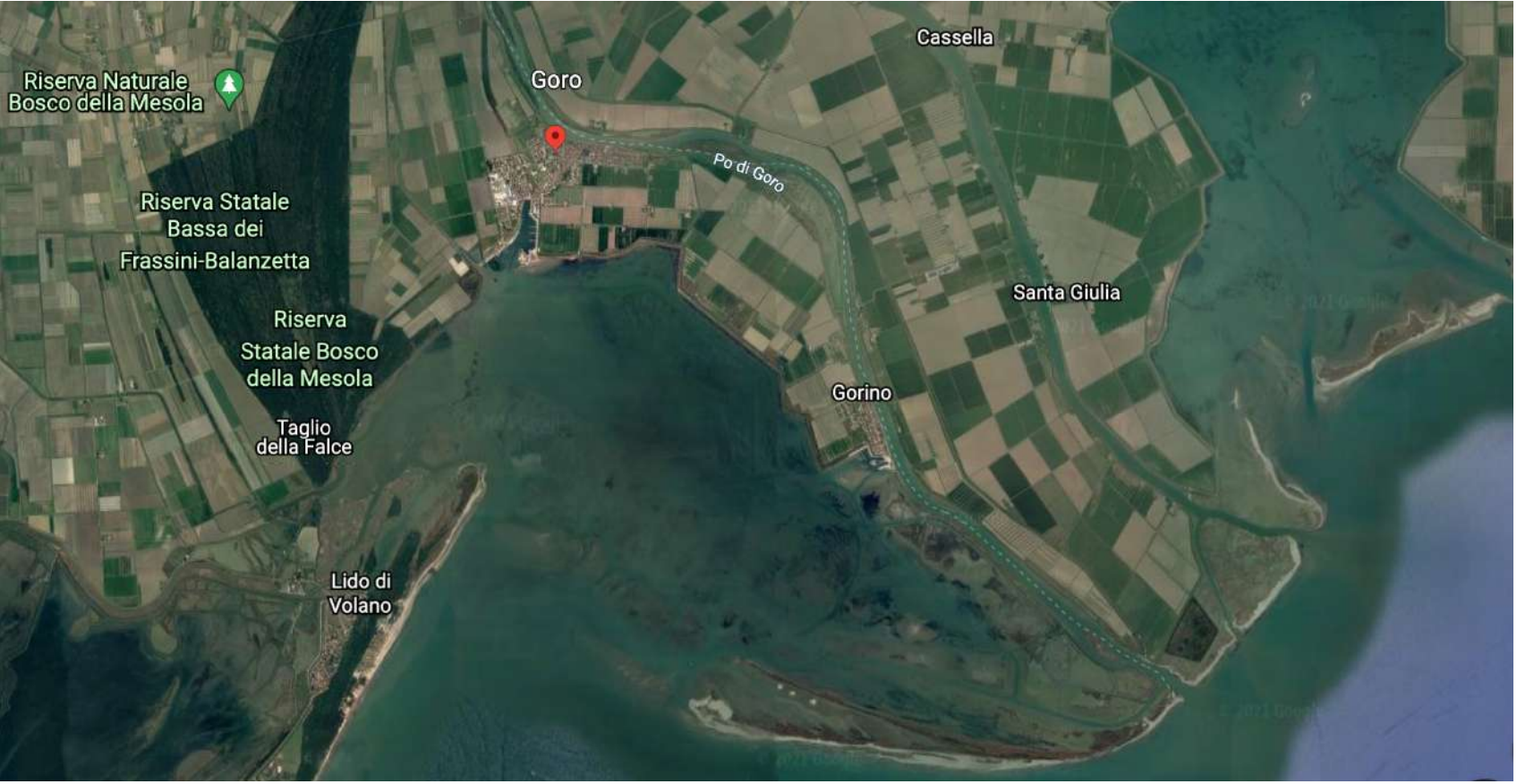
PARCO DELTA DEL PO EMILIA-ROMAGNA



5.6.1: Po River Delta decision process final report: most of contributions converged to an area of the lagoon, more sensitive to climate change effects and extremely important for biodiversity conservation and aquaculture in the whole lagoon.

This area of particular interest is the inlet between the main sandbar, closing the lagoon on the south and the, newly deposited outermost one; it is locally called «Bassunsin». This inlet and the whole system of sand bars is the most important area of the lagoon, as evidenced by the long term monitoring data on protected species (mostly plant and bird species).

5.6.2: Adaptation plan for the Sacca di Goro

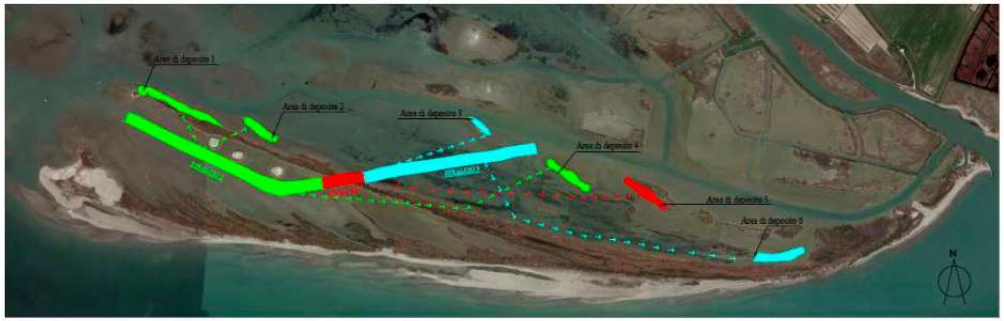
An illuminating precedent of private/public initiative for the improvement of the Sacca di Goro Lagoon is the Life Agree project which, through the private financing, has led to a substantial improvement in the qualitative state of the lagoon with the cessation, for more than 5 years, of the applicants anoxic and dystrophic crises.

At the same time to WP 5.6.2, the Consortium for the management of the Sacca di Goro (Co.Sa.Go.), which brings together the major aquaculture cooperatives, has recently proposed to the competent authorities a project for the vivification of the Bassunsin area. A sharing of the initiative will be due in the proceeding of the analysis in the WP 5.6.2.

COMUNE DI GORO
Provincia di Ferrara
Regione Emilia Romagna

MIGLIORAMENTO DELL'IDRODINAMISMO DELL'AREA "BASSUNSIN" ALL'INTERNO DELLA SACCA DI GORO

RELAZIONE SINTETICA



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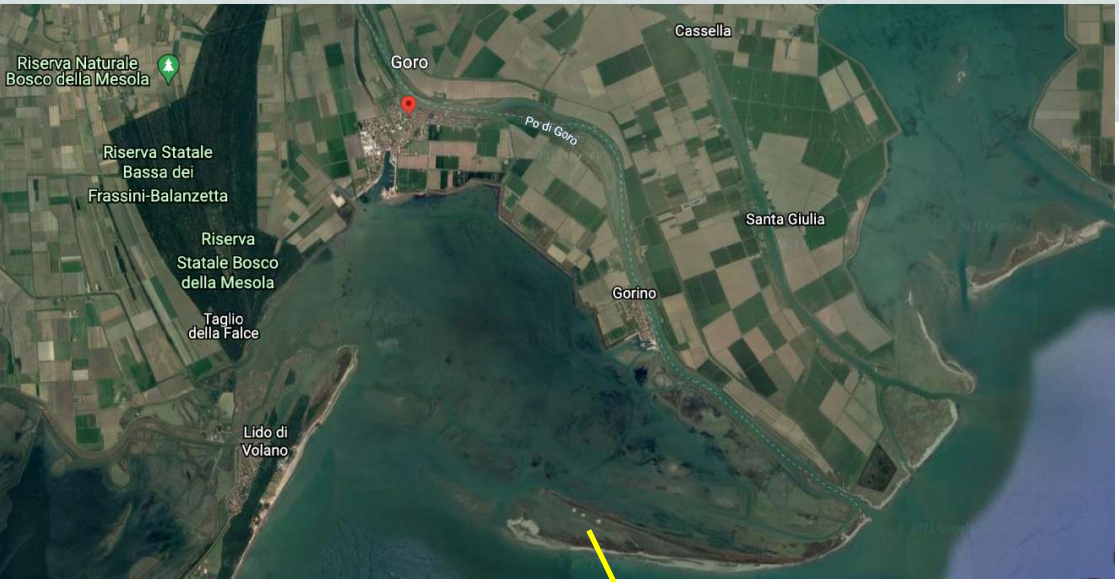
Life AGREE

coAstal laGoon long teRm managEmEnt



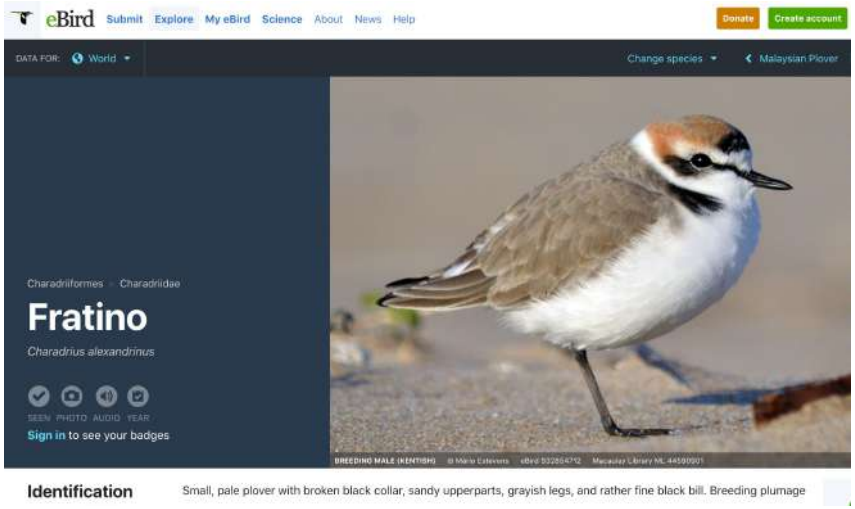


Figura 4. Stato di progetto: nuove aree per la nidificazione

To conclude, the work done by the Po delta Park in Change We Care has produced these major advances:

1. **the collection and standardization of long-term data series on protected species of plants, birds, fish and clams; scientific and dissemination articles are under preparation;**

2. **the consolidation of stakeholder participation in an management model for protected ecosystems: from Life Agree, to Change We Care and to next projects …**

3. **the ongoing analysis of clam seed distribution data to evaluate the effectiveness of the recently proposed intervention in the outer part of the Goro lagoon, with the aim of mitigating the effects of climate change.**

Thanks for the attention !

Towards the identification of climate change adaptation options for the Po River Delta

Veneto Area

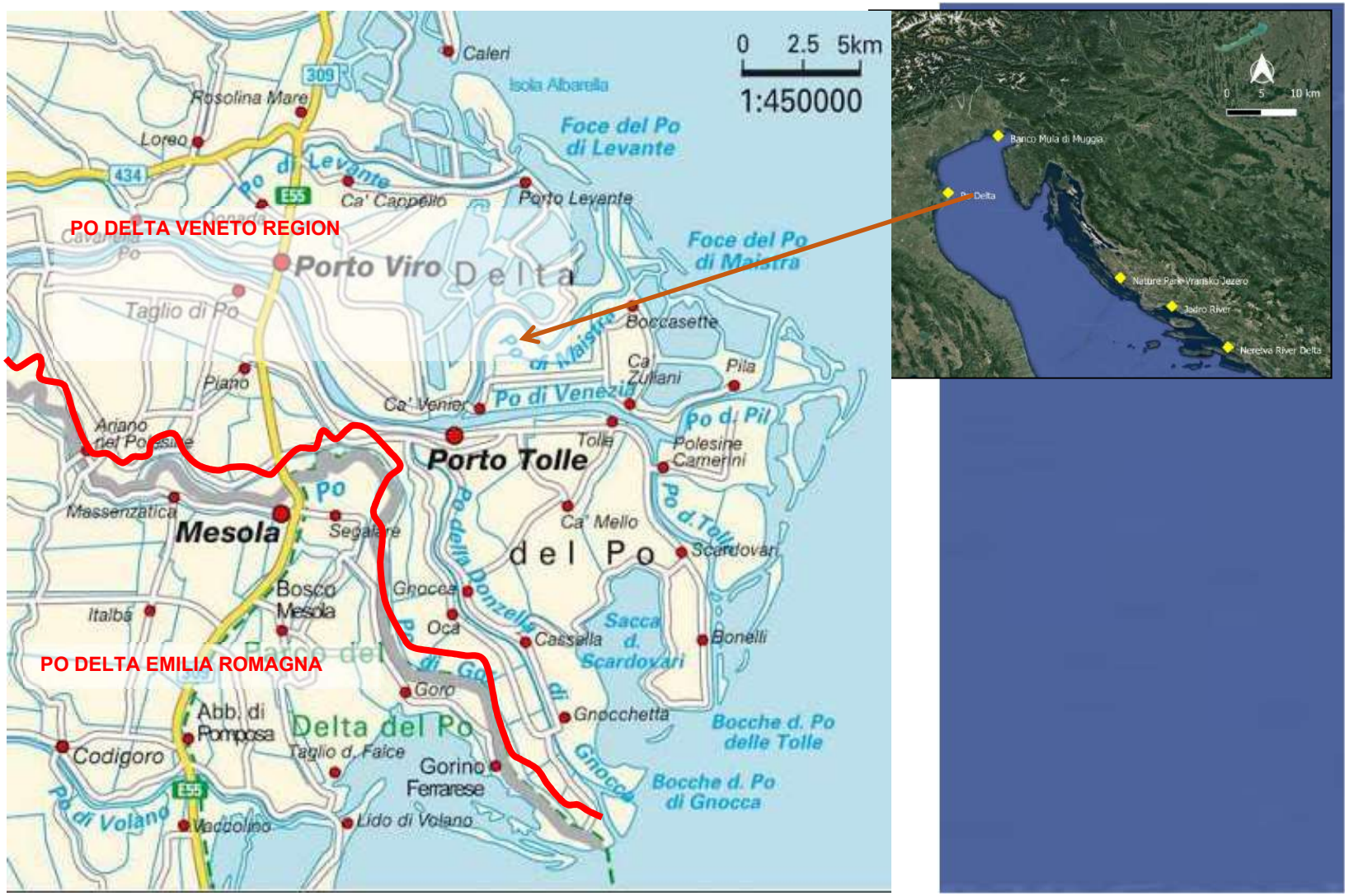
CHANGE WE CARE – Veneto Region

Marina Aurighi

Final Conference| 11 November 2021

European Regional Development Fund

The Pilot Area – Po Delta

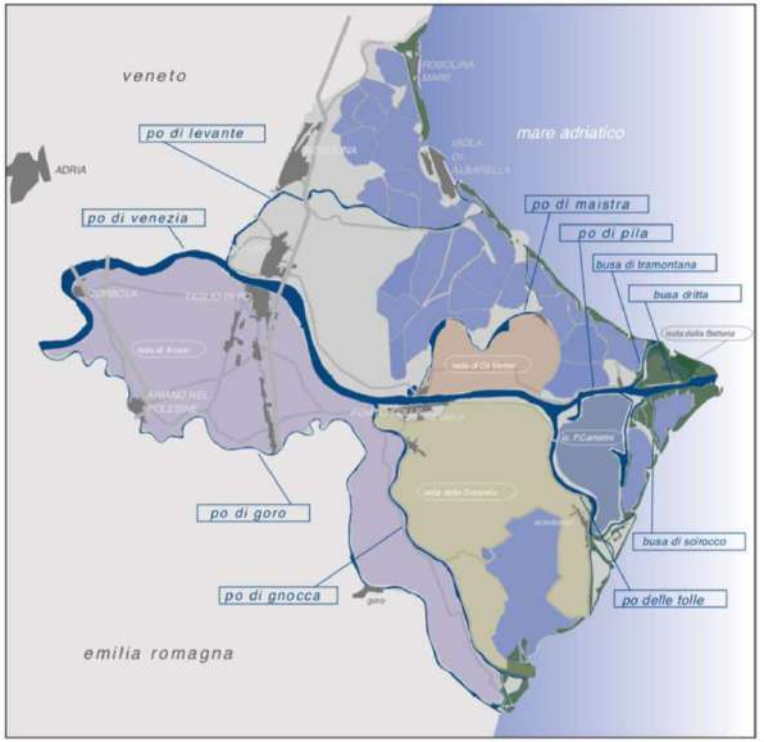


Description of the Pilot Area – Po Delta

The Po Delta represents the final sub-basin subtending the entire Po catchment, and it develops as a flat region with a surface of 472.55 km2 (1.6 % of the total Po catchment), which is almost completely below the sea level. The Delta **is the result of natural and anthropogenic processes** that have affected the mouth of the Po River for centuries, leading to its typical cuspid shape.

In this region the Po River **is divided into different branches**: Po di Levante, Po di Maistra, Po di Pila (with the mouths of Scirocco and Tramontana), Po di Tolle, Po di Gnocca, Po di Goro. **It is a recently formed area, created by slow sedimentation and extraordinary reclamation interventions; it is still constantly evolving**.

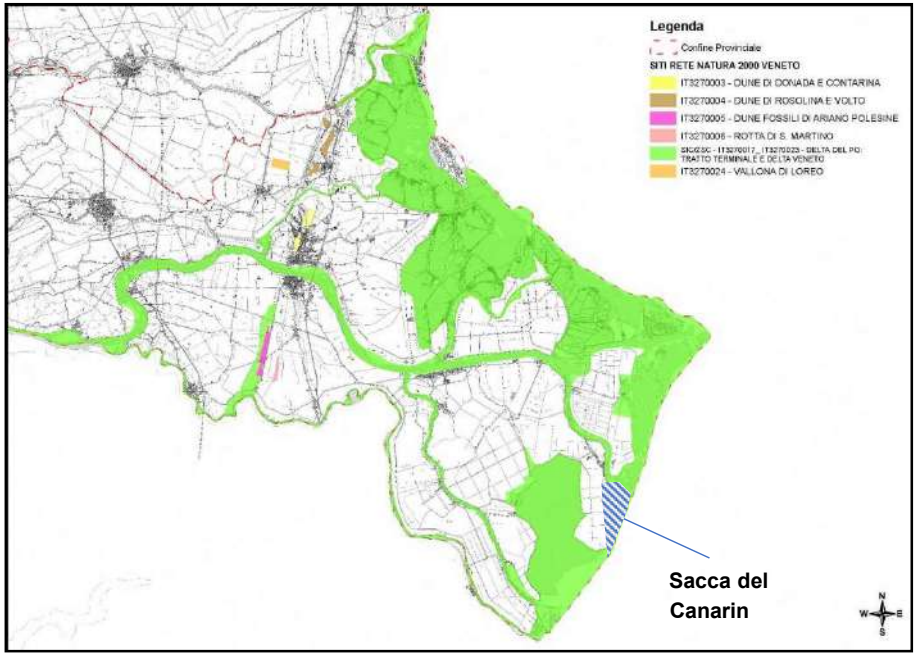
From an environmental point of view, the Po Delta, with its interconnection of aquatic and terrestrial habitats, of fresh and salt water, **represents a very important environmental system.**

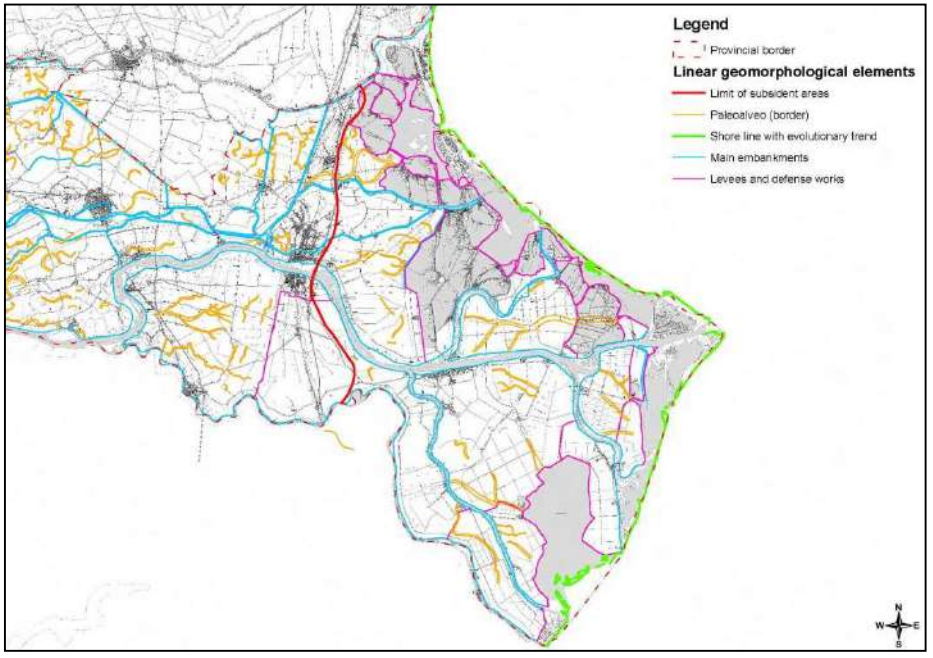


Description of the Pilot Area – Po Delta

The Delta territory **is a fragile environment**, largely below sea level and inhomogeneous, with a high naturalistic value, fragmented by a built landscape and sometimes in a state of abandonment due to catastrophic events (floods, subsidence, saline intrusions) which have reduced the urbanization and housing.

The most interesting development areas are located in the coastal strip, which**, with its lagoons and beaches, offers sites of anthropic and environmental interest**. Fishing, fish farming and tourism develop here. The internal areas are purely agricultural with a prevalence of arable land.
The territory remains emerged thanks to the hydraulic defenses and pumping systems.





Delta Po area is an UNESCO World Heritage Site. It is an "ecosystem" to be protected and preserved, in compliance with the "Habitats" directive (92/43/EC) and the "Birds" directive (79/409/EC).
The Po delta is part of the Natura 2000 Network - SCI and SPA (IT3270023 and IT 327 0017)

CWC -Project technical activity

The Change we Care project **aims** to develop a common methodology for dealing with the effects of climate change, affecting coastal and transition areas, which are notoriously particularly vulnerable.

The project activities are as follows:
WP1 - Management and coordination activities.
WP2 - Communication and dissemination activities.

TECHNICAL ACTIVITIES:
WP3 - Improvement of basic knowledge: current state and recent trends of the evolutionary processes of the coastal and transition system (lagoons).
WP4 - Evolutionary dynamics in pilot sites and in the northern / central Adriatic in relation to climate change.

PLANNING ACTIVITIES:
WP5 - Pilot sites: adaptation strategies and measures to increase resilience to climate change.

Project technical activity

The cognitive framework of the area was completed through the analysis and characterization of climatic, geological, geomorphological, sedimentological, biological, ecological, environmental, also **thanks to the work carried out by the entire partnership for WP3 and WP4.**

3.1 Hydrological, thermohaline physical and meteo-marine climate setting.
3.2 Geological and geomorphological setting and recent history.
3.3 Characterization of the fluxes (water, sediment, energy) from the mainland.
3.4 Intertidal habitats, aquatic transitional ecosystems quality and biodiversity mapping and trends.
3.5 Relationship between hydro-morphological factors and intertidal and transitional habitats.

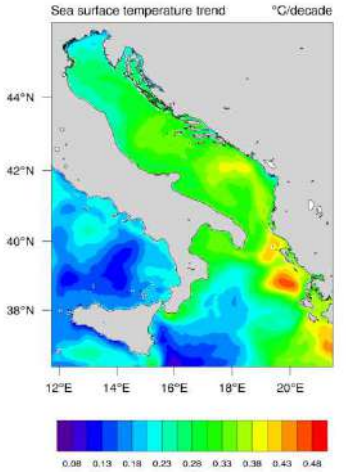
4.1 Evolution of key hydrological and physical quantities and energy fluxes.
4.2 Morphological evolution at the multi-decadal scale.
4.3 Evolution of coastal and transitional aquatic ecosystems at the multi-decadal scale.
4.4 Definition of common monitoring and observation system on the identified significative parameters.

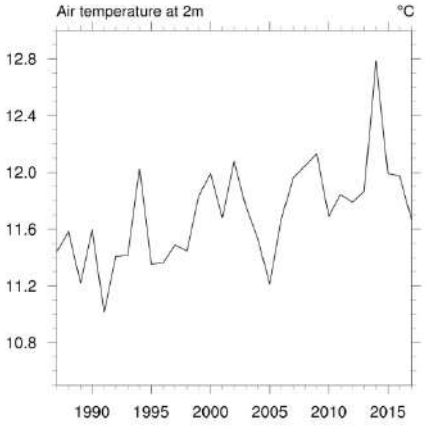
WP3 - Project technical activity

Act. 3.1 : HYDROLOGICAL, THERMO-HALINE PHYSICAL AND METEO-MARINE CLIMATE SETTING

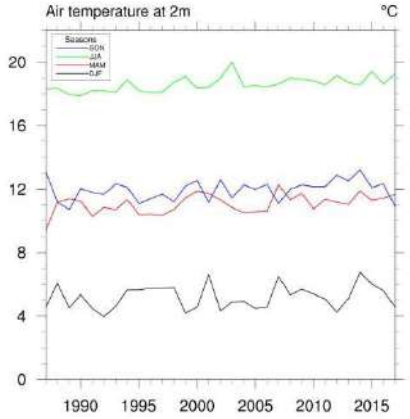
The objective was to evaluate various aspects of the current state and climate change underway at both Adriatic and local scale.

The analysis of the results focused on the identification of interannual variability and longterm trends of some key quantities (e.g. sea temperature and salinity, ocean heat content) and processes (e.g. storm surge, dense water production), as well as on ocean climate statistics performed over 30-year periods. The annual time series of temperature and precipitation were analysed, plus the wind rose, extracted for the area of Po River delta site and coming from the AdriSC climate simulation (1987-2017).





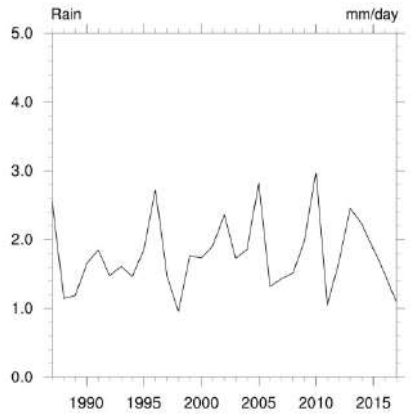
Annual air temperature at 2 m time series in the period 1987-2017 at the Po River delta site



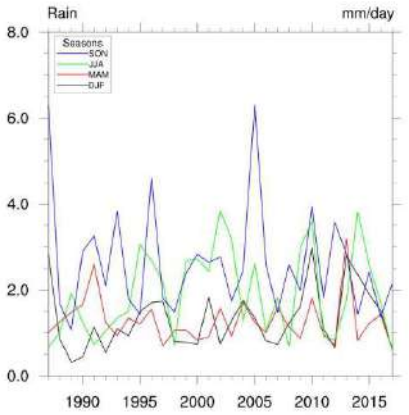
Seasonal air temperature at 2 m time series in the period 1987-2017 at the Po River delta site as

Clear **temperature** trend can be seen in the series, with the rate of approx. 0.2 oC per decade. The warming trend may be seen in all seasons, with winter mean temperatures ranging between 4 and 7 oC, while summer mean temperatures are ranging from 18 to 20 oC..

The **precipitation** rate is changing between 1 and 3 mm/day, i.e. between 400 and 1100 mm per year. The precipitation rate is maximal during autumn, when it might reach 6 mm/day, while the minimum precipitation rate is achieved during winter and spring, when it might go down to 0.4 mm/day, or about 40 mm per season.



Annual precipitation time series in the period 1987-2017 at the Po River delta site



Seasonal precipitation rate time series in the period 1987-2017 at the Po River delta site.

WP3 - Project technical activity

Act. 3.2 : GEOLOGICAL AND GEOMORPHOLOGICAL SETTING AND RECENT HISTORY

The geological and geomorphological structure and the evolutionary trend of the central-northern Adriatic and of each pilot area (including the Po delta) have been defined.

Activities

- ✓ census and collection of all information available and useful for the study of the area;
- ✓ elaboration of historical and recent maps;
- ✓ processing of aerial photos, satellite images;
- ✓ and topographic surveys estimation of the sediment balance.

Aims

- ➢ identification of the evolution of the coastline;
- ➢ evaluation of evolutionary trends (erosion / deposition) in the context of climate change;
- ➢ and of the factors that influence the transport of sediments.

Final papers

Act. 3.2.1 – Pilot areas geomorphological maps.

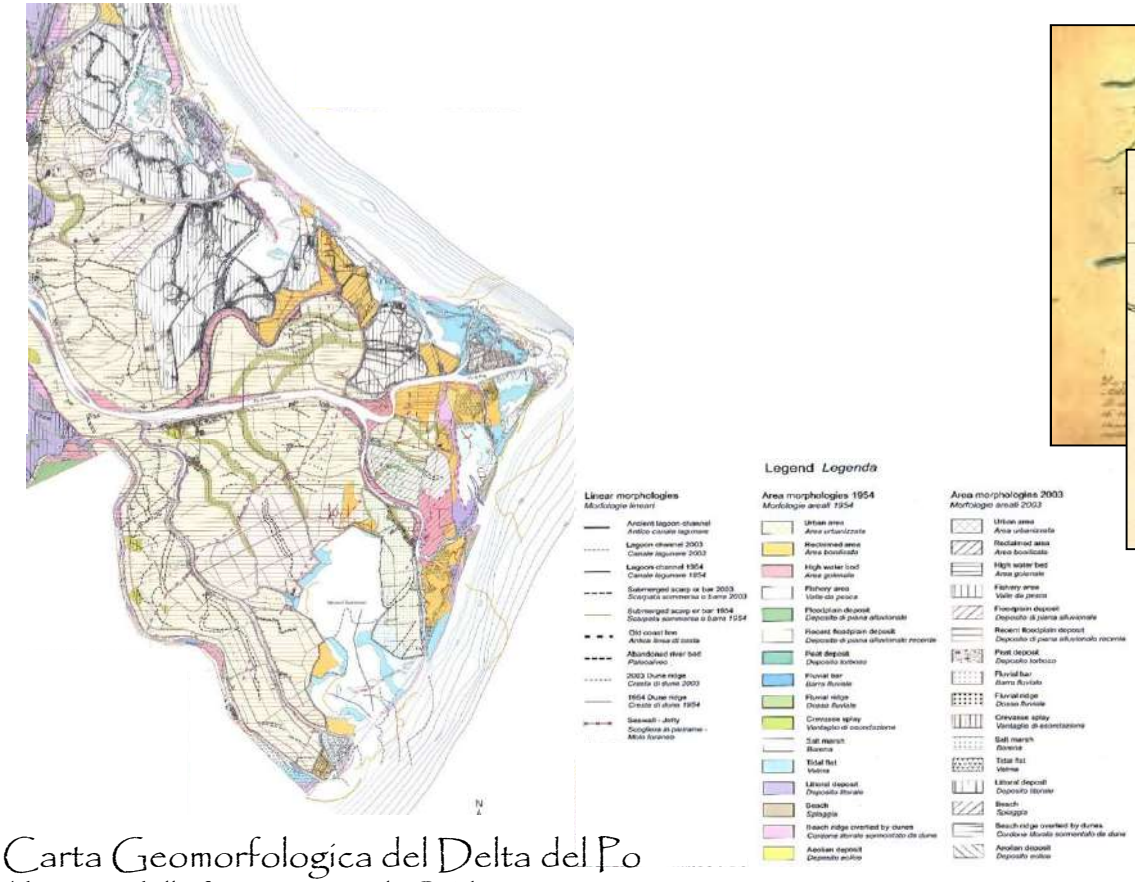
Act. 3.2.2 - Technical report on sediment stocks in the alluvial coastal systems.

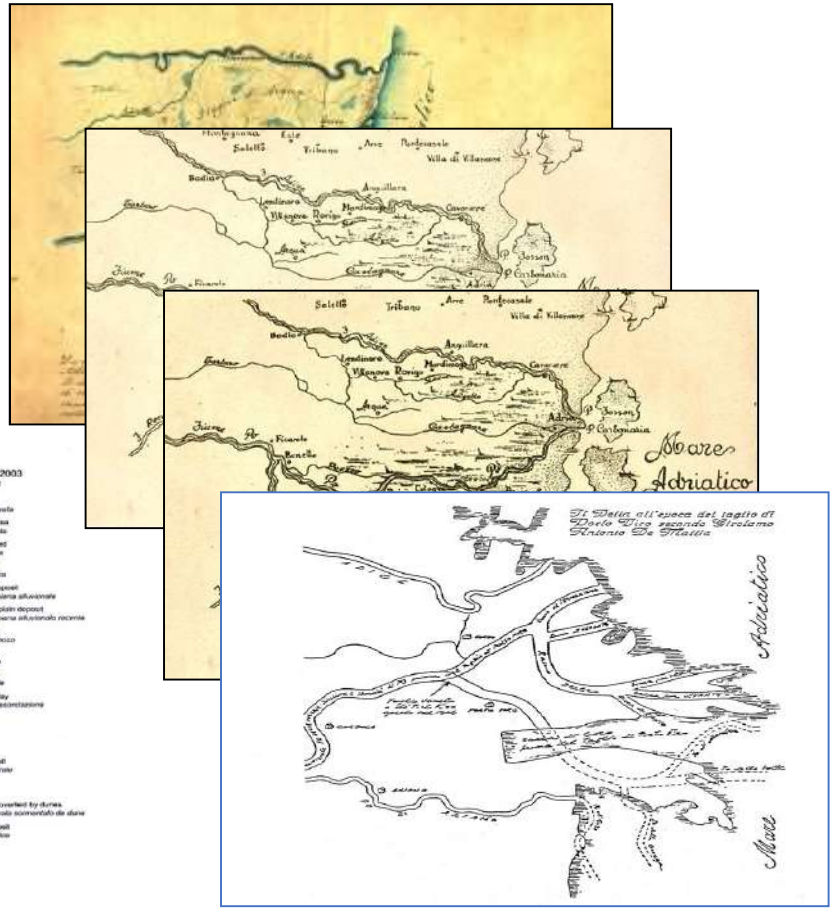
Act. 3.2.3 - Data set on geomorphological and sedimentological assessment.

WP3 - Project technical activity

Act. 3.2.1 – Pilot areas geomorphological maps:

highlighting geomorphological setting and historical evolution of the pilot areas based on historical cartography and geomorphological, geophysical and geological data.

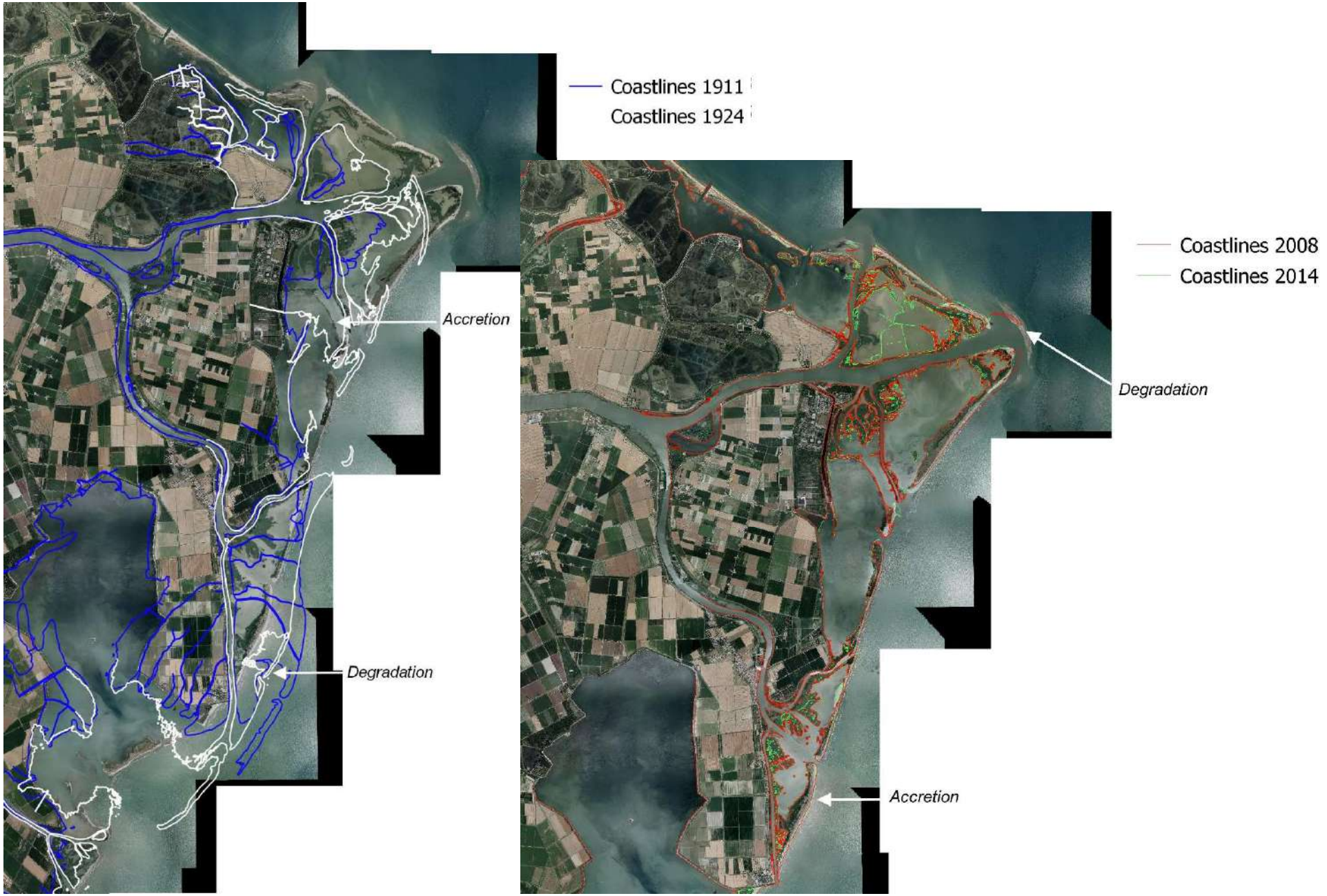




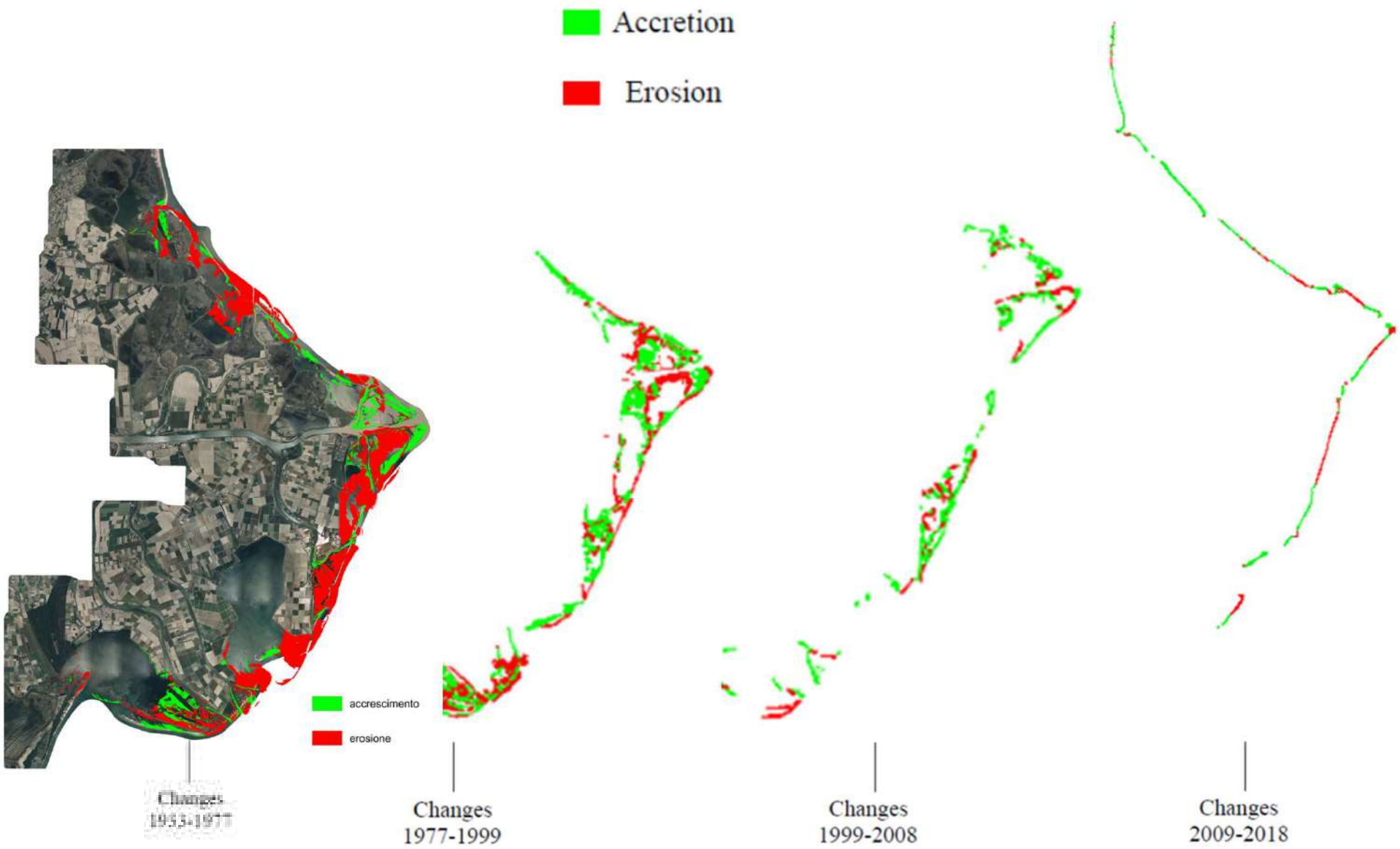
Carta Geomorfologica del Delta del Po
(derivata dalle foto aeree: voli GAI 1954-1955
e Terraltaly NR 2003 e studi precedenti).

progetto MONITOR

Evolution of the coastline of Delta Po



Evolution of the coastline: erosion and accretion

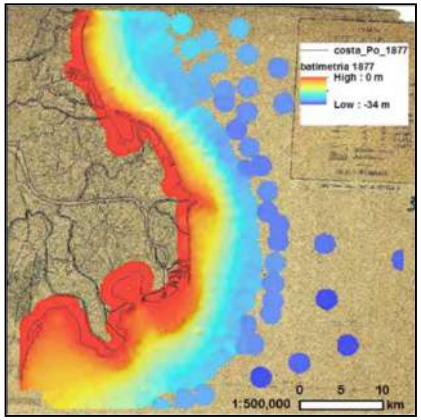


WP3 - Project technical activity

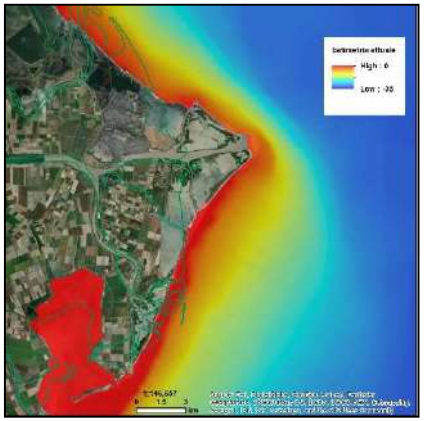
Act. 3.2.2 - Technical report on sediment stocks in the alluvial coastal systems

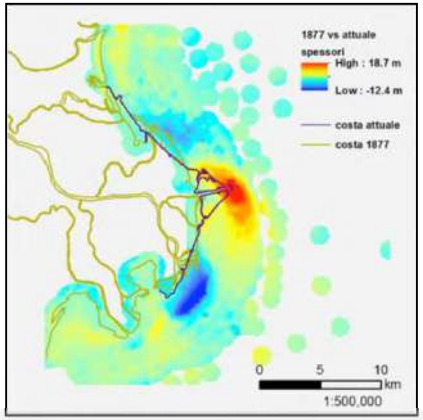
Based on available morpho-bathymetric surveys, this deliverable will provide information on sediment characteristics and a base for the identification of the extent and fate of sediment delivered from the mainland

DTM created on georeferenced Ing. Stella Map of 1886.

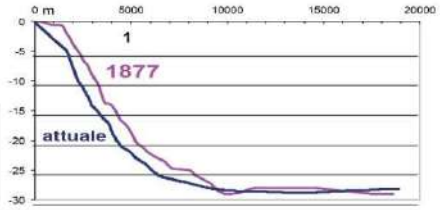


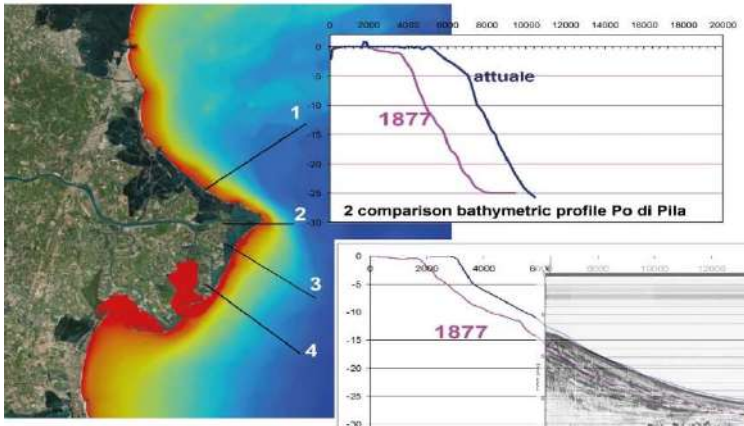
Current bathymetry from singlebeam and multibeam data.

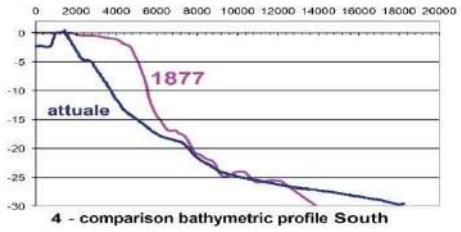




Result from difference between modern and historical bathymetry.





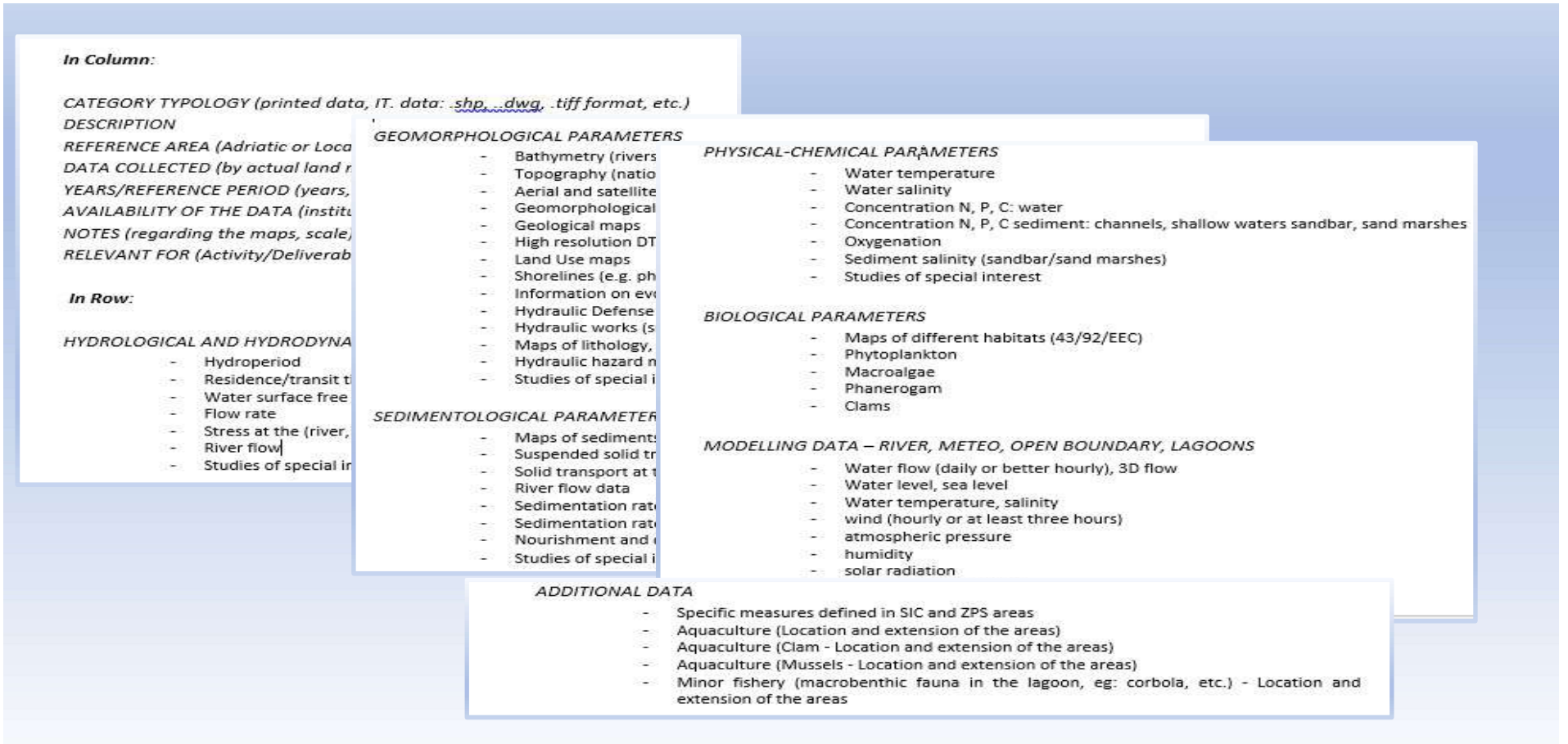


To better appreciate the variations in the most significant sections, the morphobathimetric profiles obtained by the two DTMs were compared. **Only the mouth of the Po della Pila shows a progradation** that has moved the mouth towards the sea by 4 km in 130 years with a constant increase in the volumes of deposited sediments. **The other sectors of the delta are mostly in erosion.**

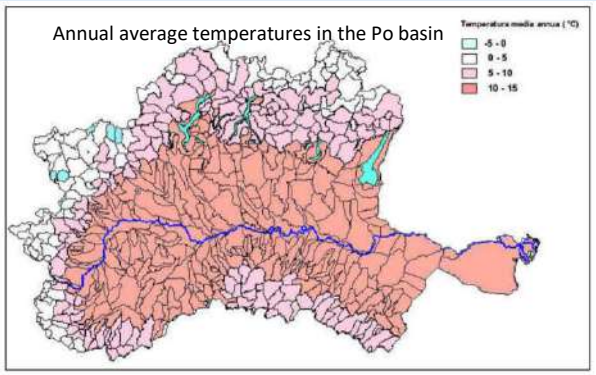
Act. 3.2.3: Data set on geomorphological and sedimentological assessment

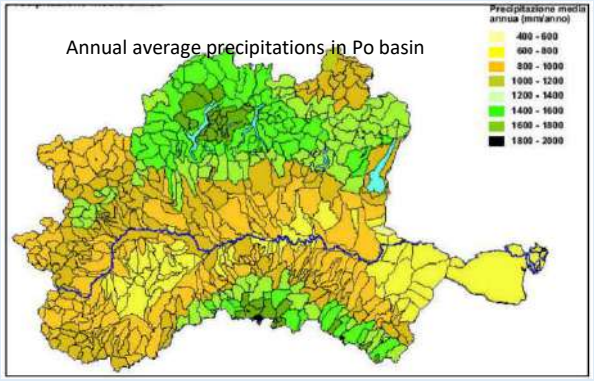
The activities consisted of research and data collection.
After a phase of implementation and reorganization of the data collected for each pilot site and the control and implementation of the data set, the analysis of the data and metadata continued and a single simplified table was compiled.

This data set organised information collated by A3.2 into a standardised format to be conveyed into database (A3.3) and GIS (A3.5).



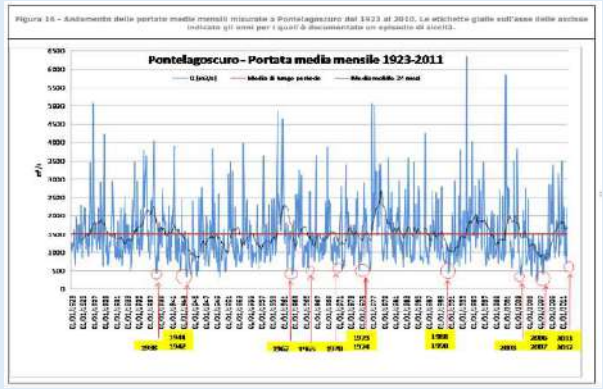
Meteorological characteristics





Hydrological characteristics

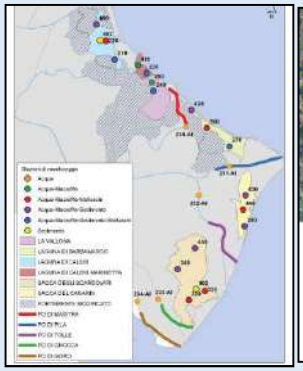
Locations of the measuring stations for the water discharge in the 2002-2011 campaign.



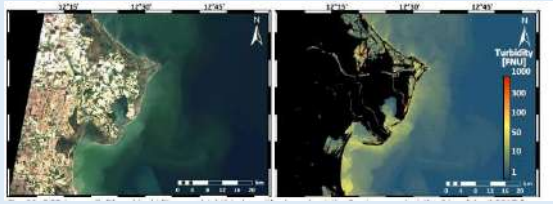
Monthly average flow rate measured in Pontelagoscuro from 1923 to 2010.

Sediment fluxes and Nutrient fluxes

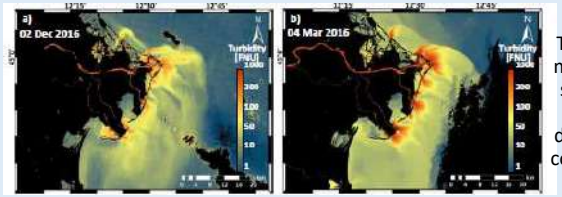
Localization of some sampling stations



Salt intrusion extension: from left to right during '50s-'60s, during the period of 70s-'80s and at the beginning of 2000



RGB image (left) and turbidity map (right) in logarithmic scale at the Po river coast (21th of April 2017 from Sentinel-2 acquisition)



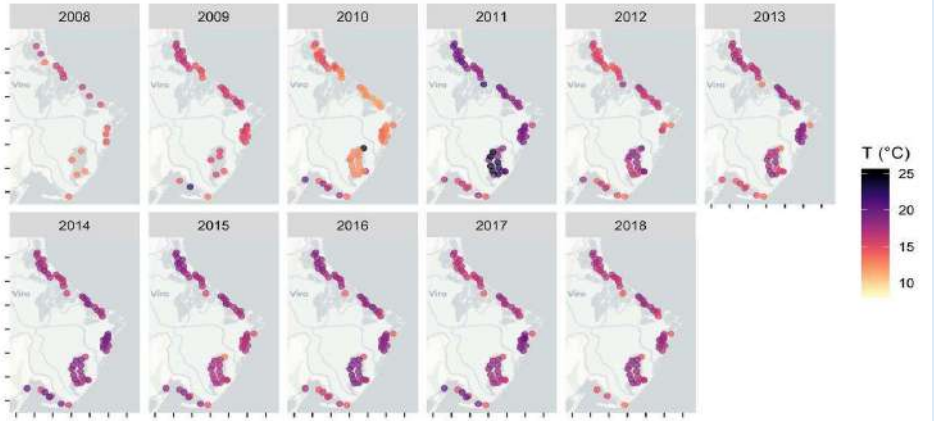
Turbidity maps (log scale) in high discharge conditions

WP3 - Project technical activity

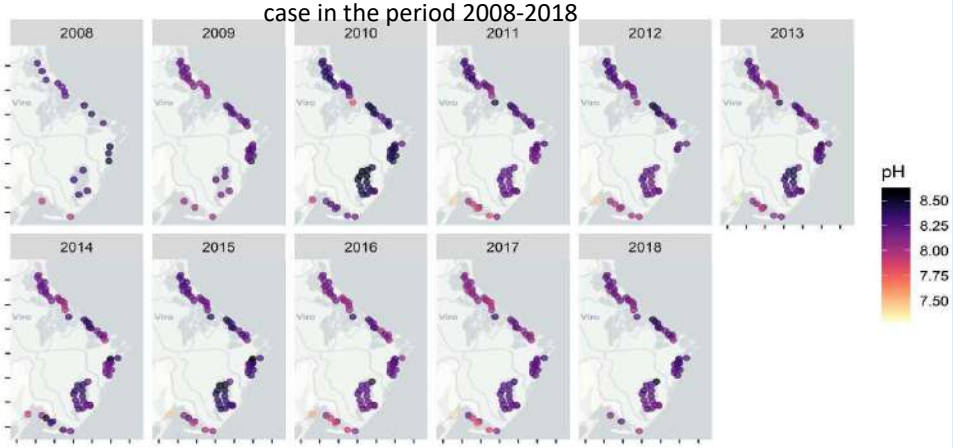
3.4. Intertidal habitats, aquatic transitional ecosystems quality and biodiversity mapping and trends

Act.: 3.4.1: the report on existing data and relative gaps described the main results of the data collection reviewing the status and trend of protected habitats, species and ecological quality elements. Maps of coastal and Intertidal habitats trend and maps of coastal and aquatic transitional ecological quality elements trend included.

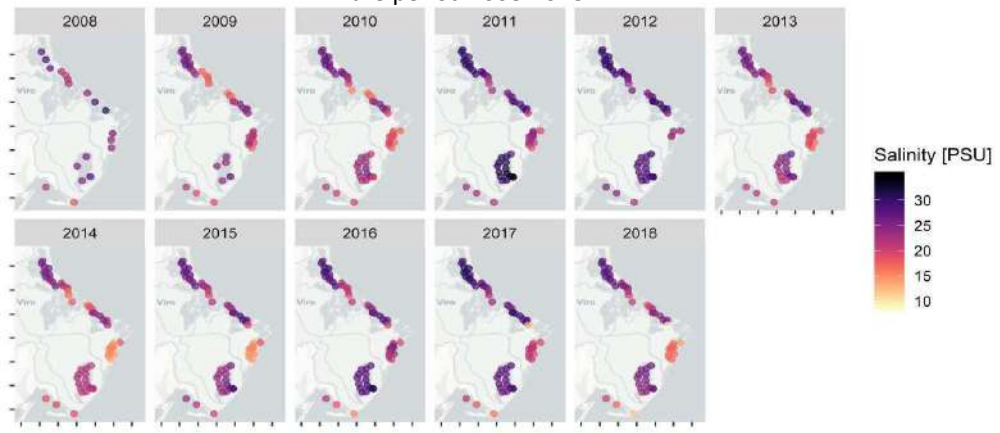
Average spring values of temperature for all collected data within the Po Delta case in the period 2008-2018.



Yearly values (average) of pH for all collected data within the Po Delta case in the period 2008-2018



Yearly values (average) of salinity for all collected data within the Po Delta case in the period 2008-2018



The analysis of the data and studies confirms that the Po Delta is a sensitive and vulnerable area, as it develops at the closure section of the Po River, whose water and sediment fluxes are key factors at shaping the delta morphology, **but also at conveying pollutants and nutrients to the coastal areas**.

Moreover, transition environments such as lagoons and river mouths are delicate environments highly influenced by tides, river supplies, weather conditions and exchanges with the sea.

3.5. Relationship between hydro-morphological factors and intertidal and transitional habitats

For the Po Delta pilot site, the evolution of some characteristics of the ecosystem was studied by means of the application of Habitat Suitability Models (HSMs). In particular, this approach will be implemented for three habitats/species:

a) **manila clam**, Venerupis philippinarum, a species particularly relevant for the farming activities in several lagoons of the Delta;
b) **reed beds**, an habitat whose distribution already shrunk in the past, particular relevant for the ecological role in transitional water bodies and associated with several species of conservation concern;
c) **seagrass species**, protected species, scarcely present in the Delta but showing positive trends in other Northern Adriatic transitional areas.

Pilot site	Po Delta				
Specific target	Manila clam				
CC issue addressed	Conflicts between relative sea level rise and aquaculture maintenance				
Relation between the studied species and environmental conditions	Variables (relevant variables for the species)	Type of available measures	What will be available as CC scenario?	Gap for realising the habitat/species	Strategy for filling the gap?	Tools for the projection [To be defined within A4.3]
	Salinity	Field data for the period 2 [D3.4.1, D3.4.2]; simulations from site spec resolution hydrodynamic [D4.1]				
	Water temperature	Field data for the period 2 [D3.4.1, D3.4.2]; simulations from site spec resolution hydrodynamic [D4.1]				
	Water Residence Time	Simulations from site spec resolution hydrodynamic [D4.1]				
	Trophic state (i.e. nutrient concentration)	Field data for the period 2 [D3.4.1, D3.4.2].				
	Sand in sediment	Field data for the period 2 [D3.4.1, D3.4.2].				
	Water level / water depth	Simulations from site spec resolution hydrodynamic [D4.1]				
	Water speed	Simulations from site spec resolution hydrodynamic [D4.1]				
	Chlorophyll-a	Field data for the period 2 [D3.4.1, D3.4.2].				
	Dissolved Oxygen	Field data for the period 2 [D3.4.1, D3.4.2].				

Table 10: variables, strategies and tools for addressing

Pilot site	Po Delta				
Specific target	Reed beds				
CC issue	Effects of salt gradient on habitat and species (e.g. reedbed and seagrasses); relative sea level				
Relation between the studied species and environmental conditions	Variables (relevant variables for the species)	Type of available measures	What will be available as CC scenario?	Gap for realising the habitat/species	Strategy for filling the gap?	Tools for the projection [To be defined within A4.3]
	Salinity	Field data 2018 [D3.4 simulation resolution modelling [D4.1]				
	Water temperature	Field data 2018 [D3.4 simulation resolution modelling [D4.1]				
	Water Residence Time	Simulation high resol modelling [D4.1]				
	Trophic state (i.e. nutrient concentration)	Field data 2018 [D3.4				
	Sand in sediment	Field data 2018 [D3.4				
	Water level / water depth	Simulation high resol modelling [D4.1]				
	Water speed	Simulation high resol modelling [D4.1]				
	Water transparency (as TSS)	Field data 2018 [D3.4				

Table 11: variables, strategies and tools for addressing

Pilot site	Delta Po					
Specific target	Seagrasses					
CC issue addressed	Effects of salt gradient on habitat and species (e.g. reedbed and seagrasses); Sea level rise					
Relation between the studied species and environmental conditions	Variables (relevant variables for the species)	Type of available measures	What will be available as CC scenario?	Gap for realising the habitat/species projection	Strategy for filling the gap?	Tools for the projection [To be defined within A4.3]
	Salinity	Field data for the period 2008-2018 [D3.4.1, D3.4.2]; simulations from site specific high resolution hydrodynamic modelling [D4.1]	Salinity projections from site specific high resolution hydrodynamic modelling [D4.1]	/	/	Species specific - Habitat Suitability Model adapted within Change We Care (A4.3; originally developed for the Venice lagoon)
	Water temperature	Field data for the period 2008-2018 [D3.4.1, D3.4.2]; simulations from site specific high resolution hydrodynamic modelling [D4.1]	Water temperature projections from site specific high resolution hydrodynamic modelling [D4.1]	/	/	Species specific - Habitat Suitability Model adapted within Change We Care (A4.3; originally developed for the Venice lagoon; Zucchetta, 2010; Corta 2014; 2015; 2016)
	Water Residence Time	Simulations from site specific high resolution hydrodynamic modelling [D4.1]	WRT projections from site specific high resolution hydrodynamic modelling [D4.1]	/	/	Species specific - Habitat Suitability Model adapted within Change We Care (A4.3; originally developed for the Venice lagoon; Zucchetta, 2010; DAIS-CORILA, 2015; 2016; 2017)
	Trophic state (i.e. nutrient concentration)	Field data for the period 2008-2018 [D3.4.1, D3.4.2];	/	No projection for the future	What if scenarios (i.e. qualitative changes explored)	Species specific - Habitat Suitability Model adapted within Change We Care (A4.3; originally developed for the Venice lagoon; Zucchetta, 2010; DAIS-CORILA, 2015; 2016; 2017)
	Sand in sediment	Field data for the period 2008-2018 [D3.4.1, D3.4.2];	/	No projection for the future	Business as usual	Species specific - Habitat Suitability Model adapted within Change We Care (A4.3; originally developed for the Venice lagoon; Zucchetta, 2010; DAIS-CORILA, 2015; 2016; 2017)
	Water level / water depth	Simulations from site specific high resolution hydrodynamic modelling [D4.1]	Water level projections from site specific high resolution hydrodynamic modelling [D4.1] (fixed bathymetry)	/	/	Species specific - Habitat Suitability Model adapted within Change We Care (A4.3; originally developed for the Venice lagoon; Zucchetta, 2010; DAIS-CORILA, 2015; 2016; 2017)
	Water speed	Simulations from site specific high resolution hydrodynamic modelling [D4.1]	Water speed projections from site specific high resolution hydrodynamic modelling [D4.1]	/	/	Species specific - Habitat Suitability Model adapted within Change We Care (A4.3; originally developed for the Venice lagoon; Zucchetta, 2010; DAIS-CORILA, 2015; 2016; 2017)
	Water transparency (as TSS)	Field data for the period 2008-2018 [D3.4.1, D3.4.2].		No projection for the future	What if scenarios, talking into account empirical relationships between available data (D3.4.1 - D3.4.2) and variables modelled and projected with hydrodynamic model.	Species specific - Habitat Suitability Model adapted within Change We Care (A4.3; originally developed for the Venice lagoon; Zucchetta, 2010; DAIS-CORILA, 2015; 2016; 2017)

Table 12: variables, strategies and tools for addressing CC impacts on sea grasses in the Po Delta

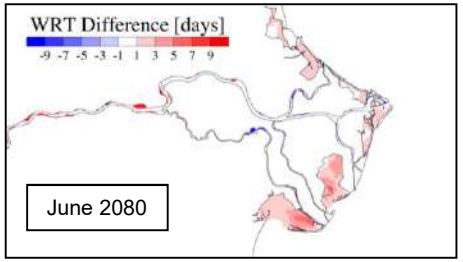
WP4 - Evolution dynamics in Pilot Sites (Po Delta)

4.1 - Evolution of key hydrological and physical quantities and energy fluxes

In order to investigate future changes through modelling activities, **a scenario was defined**. The study took into account the worst case available from IPCC (RCP8.5, https://ar5-syr.ipcc.ch/topic_futurechanges.php) and valuated the change trend corresponding to the last period simulated (2080-2100), to make clear the rate of change.

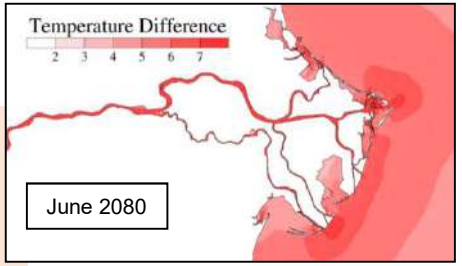
Currently:

- **lagoons are exposed to fresh water differently**. The lagoons modify the connection with the salinity in accordance with the river (eg Barbamarco, Basson);
- the various lagoons have different responses to evaporative processes;
- all lagoons have **low internal circulation**, on a monthly and seasonal average (5-10 cm / s);
- the variations in residence times of the lagoons are correlated with the area of influence and the mass of water from the river, the morphology, and the distribution of salinity and temperature at the coast;
- **Canarin responds less to the variability of coastal salinity and has a weaker internal dynamics than other lagoons (it behaves like a narrow lagoon**);
- **Marinetta, Barbamarco and Basson have more open lagoon characteristics** / greater water exchange capacity.



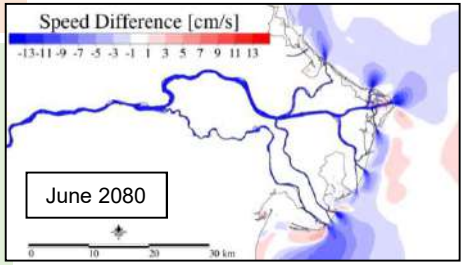
In the future scenario:

- **variations in the ability of the lagoons to maintain internal dynamics and exchange with the sea**;
- maximum **increase in residence time in the Sacca di Scardovari** (+7 days);
- exchange kept efficient for Basson, Canarin and Barbamarco (due to the greater influence of the river);
- increase in renewal times in Marinetta-Vallona in internal peripheral areas (12 days vs 7 days in the current case).



Focus on Laguna del Canarin :

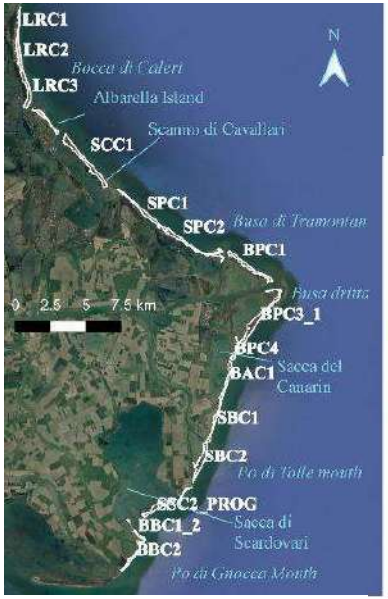
- **more inland areas of Canarin saltier than the present case for the majority of the year.** Effective river supply for the decrease of salinity in a few months;
- variations in salinity and temperature depend on the greater reactivity to evaporative / precipitative processes and surface heat fluxes;
- **minor changes in residence times**.



WP4 - Evolution dynamics in Pilot Sites (Po Delta)

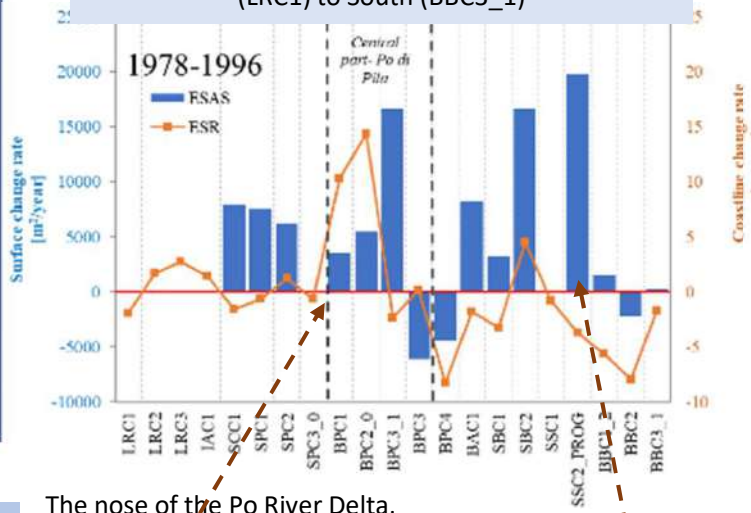
WP 4.2 Coastal vulnerability

To identify coastal vulnerabilities and identify areas at risk, a study of past and recent coastal evolution was carried out, and the potential and real Coastal Vulnerability Index (short term) was assessed.



It is a very dynamic system characterized by some regions more stable than others, while other regions shrinking because sediment deprived.

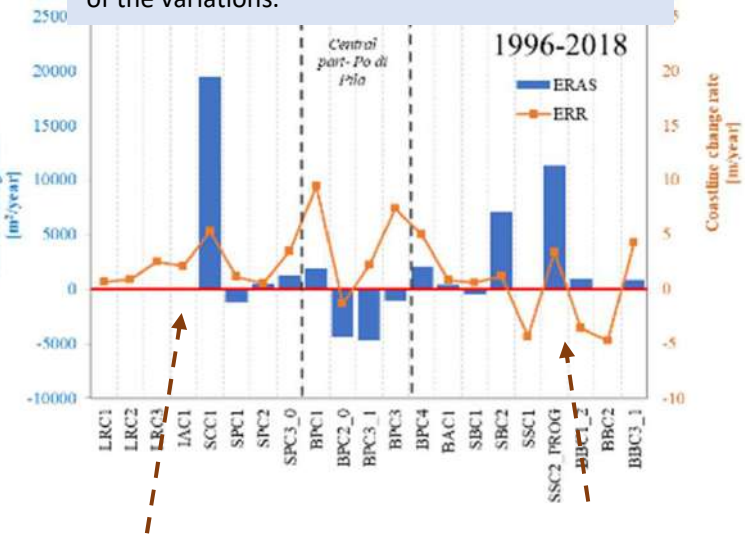
Historical evolution of the coastline (line) and the aerial extension of the barrier islands (bars). Rate of the variations. The cells are ordered from North (LRC1) to South (BBC3_1)



The nose of the Po River Delta, corresponding to Po di Pila, shows an extremely variable behavior, since it has been always evolved naturally, without any stabilizing interventions or human modifications.

Continuous interventions have been carried out in the lagoon of Scardovari, whose island (SCC2_PROGR) is maintained in its specific location with periodic nourishments and re-profiling.

Recent evolution of the coastline (line) and the aerial extension of the barrier islands (bars). Rate of the variations.



The cutting of the Boccasette bench (due to the water outflow of the Po di Maistra) caused the north-west migration of the northern sector of this bar and its merger with the Cavallari bench (SCC1).

The banks in the southern part have a tendency to translation (rollover): the entire barrier migrates towards the ground, sometimes becoming thinner (less than in the past).

WP4 - Evolution dynamics in Pilot Sites (Po Delta)
Coastal Vulnerability Index

The **Coastal Vulnerability Index** (CVI) is one of the simplest and commonly used methods to assess coastal vulnerability to sea level rise driven erosion and/or inundation. In the framework of the Change We Care project, the working group of Veneto Region, supported by the University of Trieste, has computed this index for the Po Delta following the methodology developed by the Friuli Venezia Giulia Region and the University of Trieste and based on the Gornitz approach.

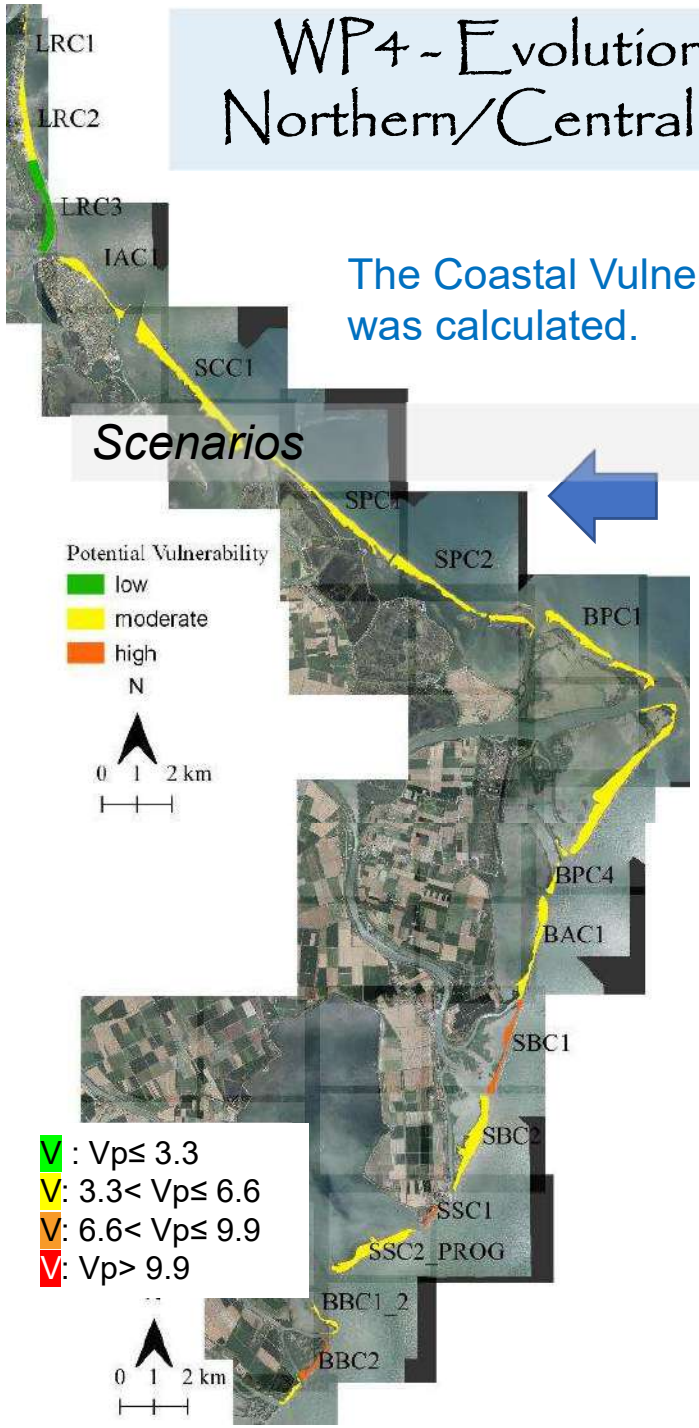
The **potential vulnerability** is defined as a linear combination of morphological and evolution variables, which measure the **natural susceptibility of the coastal regions to the erosion and overstepping**.

The presence of natural and rigid protections leads to a reduction of the potential vulnerability, resulting in what it is called **real vulnerability.**

Type of factors		Beach		Barrier Island	
Geological-morphological factors	PF	Sea-bottom slope	0.6	Sea-bottom slope	0.6
	SE	Width of the subaerial beach	0.7	Average width of the barrier island	0.6
	QM	Average height of the subaerial beach	0.7	Average height of the barrier island	0.5
				Vegetation coverage	0.3
60.61%	Sum		2	Sum	2
Evolutionary trend factors	ERR	Recent evolution of the coastline	0.4	Recent evolution of the coastline	0.2
	ESR	Historical evolution of the coastline	0.2	Historical evolution of the coastline	0.1
	TEF	Sea-bottom evolution	0.5	Sea-bottom evolution	0.5
				Recent evolution of the area of the barrier island	0.2
				Historical evolution of the area of the barrier island	0.1
Pressure from usage	PU	Touristic pressure	0.2	Touristic pressure	0.2
39.39%	Sum		1.3	Sum	1.3

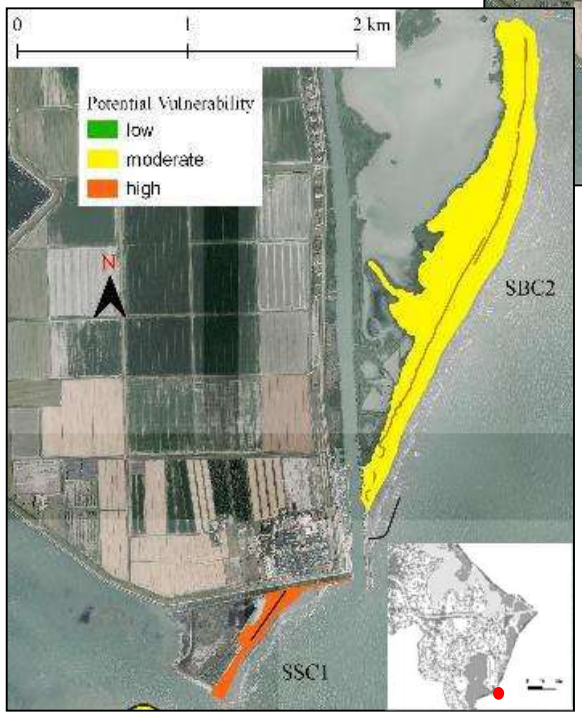
WP4 - Evolution dynamics in Pilot Sites and Northern/Central Adriatic under climate change

The Coastal Vulnerability Index (short term) was calculated.

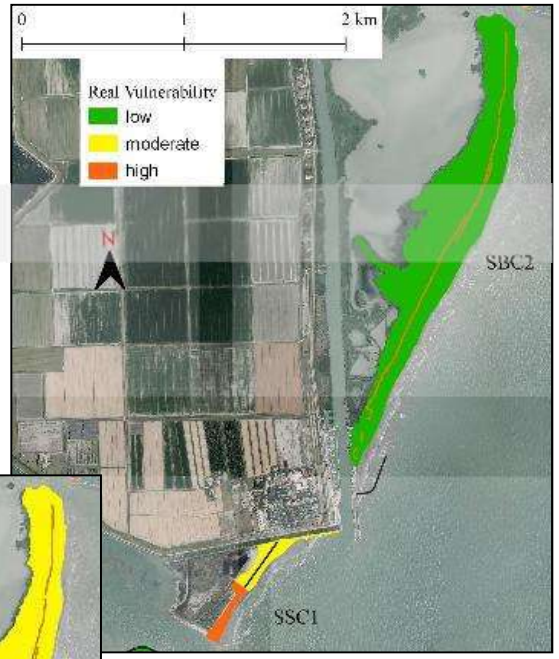


Scenarios

potential vulnerability



real vulnerability



WP4 - Evolution dynamics in Pilot Sites and Northern/Central Adriatic under climate change

4.3 - Evolution of coastal and transitional aquatic ecosystems at the multidecadal scale (PP3 – ISPRA)

A3.1, A3.2, A3.3, A3.4
Hydrological, thermohaline physical and meteo-marine, climate, Geological and geomorphological settings and Characterization of water and sediment fluxes from the mainland; habitats and biodiversity mapping – status and trend

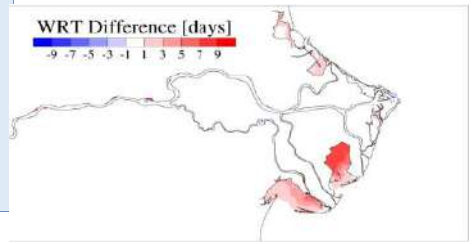
A3.5
Relationship between hydro-morphological factors and intertidal and transitional habitats

A4.1 and 4.2
Evolution of key hydrological and physical quantities and fluxes. The environmental variables related to the water dynamics in the delta system (e.g. water temperature, salinity, water level, current speed, water residence time - WRT, etc.) were simulated by ISMAR-CNR with the 3D hydrodynamic model SHYFEM

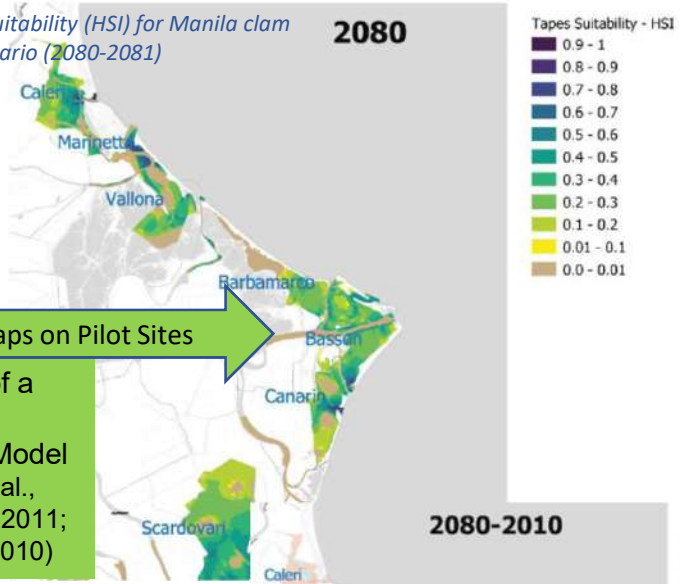
A4.3
Evolution of coastal and transitional aquatic ecosystems at the multidecadal scale (ISPRA)

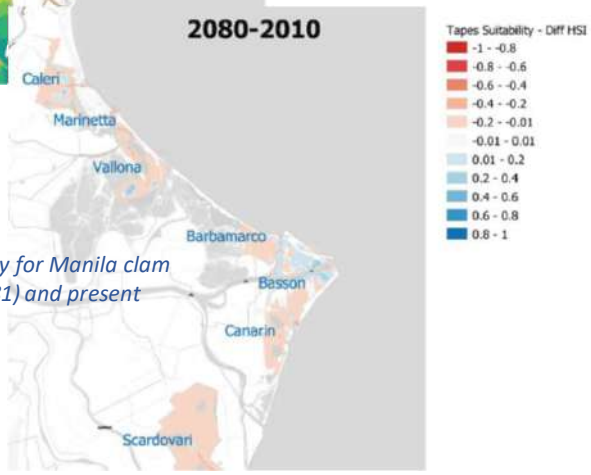
Prediction maps on Pilot Sites

Definition of a Habitat Suitability Model (Vincenzi et al., 2006, 2007, 2011; Zucchetta, 2010)



Habitat Suitability (HSI) for Manila clam in CC scenario (2080-2081)

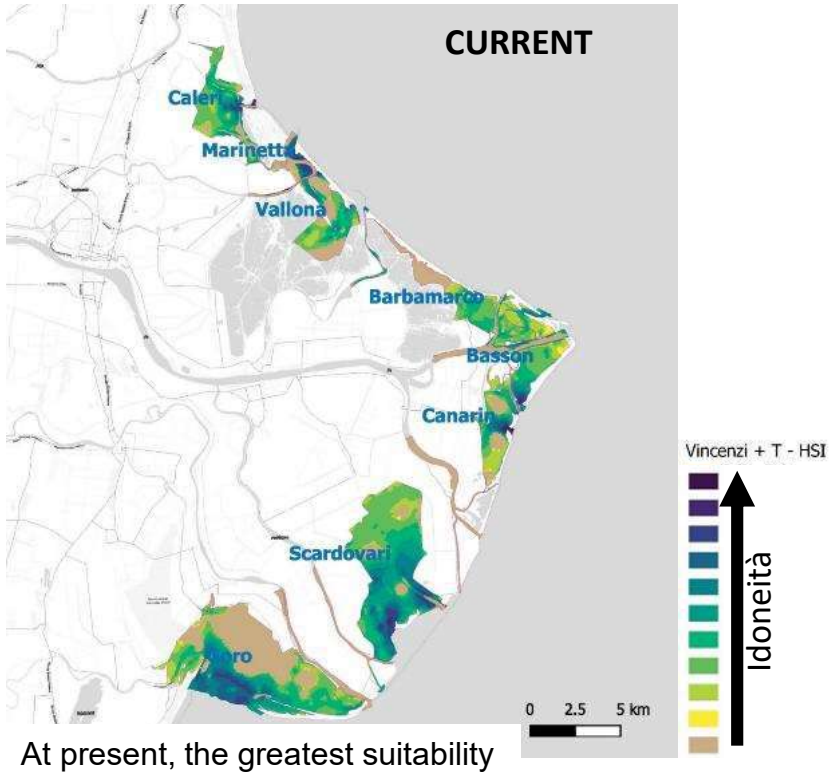




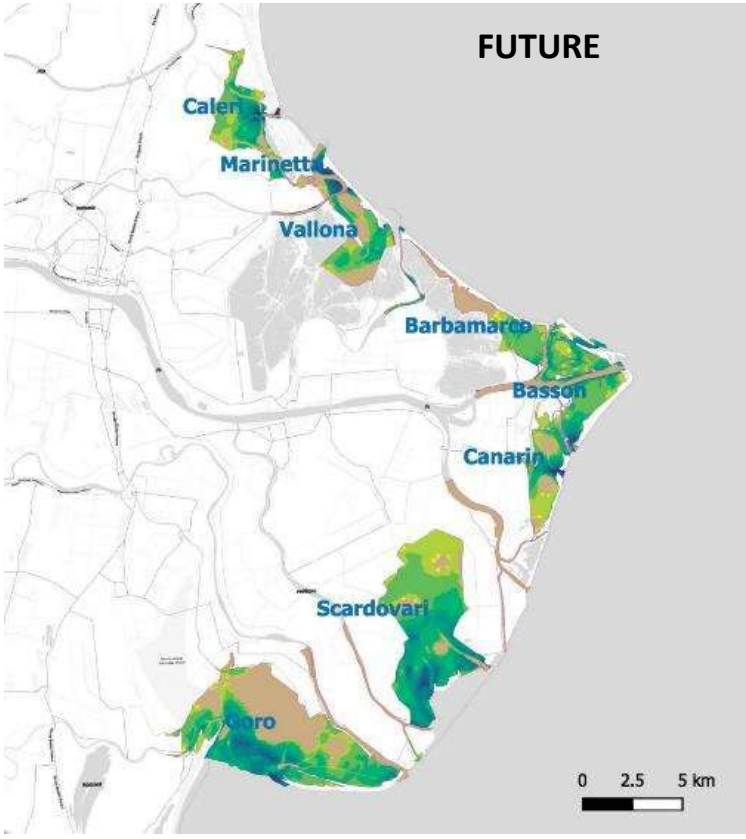
Differences of Habitat Suitability for Manila clam between CC scenario (2080-2081) and present state (2010-2011)

WP4 - Evolution dynamics in Pilot Sites and Northern/Central Adriatic under climate change

4.3 - Evolution of coastal and transitional aquatic ecosystems at the multidecadal scale (PP3 – ISPRA)



At present, the greatest suitability is present in areas with greater trade with the sea with a decreasing gradient towards the hinterland



On a general level, the distribution of suitability is confirmed with slight variations that can only be appreciated through a map of differences

Manila clam

Main problems (focus on lagoon environments)

The morphological and environmental features of the lagoons represent a peculiar aspect in the management objectives of these areas. In this respect, some crucial features can be highlighted:

1. Low depth (1-2 m).
2. Connection to the sea through one or more mouths, which regulate the exchange of marine water.
3. Important annual temperature variation.
4. Large salinity variation.

The main problems of the lagoons are connected to the intrinsic and highly variability of their environmental and morphological conditions, which tend to change quickly in response to the external factors.
In particular,

i) the salinity levels are extremely mutable and depend on the water exchanges with the sea and Po river (through floods);
ii) the oxygen content in the shallowest areas has a large impact on the production activities;
iii) the water quality is threatened by algae blooming and nutrients (phosphates and nitrates) coming from the fluvial waters;
iv) the infilling of the lagoons, due to sediment deposition, influence the internal circulation and consequently the fishing and shell-farming production;
v) the continuous erosion of the external spits that usually protect the lagoons from the open sea threaten the same existence of the lagoon areas.

One of the main challenges is **the stabilization of the lagoon environment** for the economic and development purposes, without deteriorating their value, especially considering the mutable conditions that the Climate Change will bring.

Main problems (focus on delta area)

The phenomenon of the **salt intrusion** consists in the movement of saline water into aquifers.
The salt wedge often develops at the river mouth, propagating at the bottom of the riverbed, since it has a higher salt concentration and is consequently denser than the fluvial fresh water. In the case of the Po River, whose riverbed near the mouth is below the sea level, this process is almost always present and is pronounced throughout the year.

The effects of the salt intrusion can be summarized as follows:

1. modification of the biological characteristics with changes in the trophic chain and consequent effects on the fish population with impacts on fishing activities;
2. interruption of withdrawals for irrigation, with serious damages on agricultural activities;
3. interruption of the water supply in the easternmost part of Polesine. The drinking water plants are not, in fact, able to desalinate the water;
4. salinization of the aquifers;
5. drying up of coastal areas and micro desertification processes.

On the other hand, the intrusion of the saline water along the river mouths of the Po River, by modifying the environmental and trophic conditions of the delta branches, often leads to favourable situations for the settlement of juveniles of marine / brackish species, some of which of considerable interest for the local economy. Recently, the final part of Po della Pila has started to host large settlements of clam juveniles Tapes philippinarum, becoming an area of economic interest, as it represents an exploitable natural fishing area.

WP5 - Adaptation plan / design of interventions / pilot interventions on Po River Delta

Structure:

Description of the Pilot Area, Knowledge Framework and Scenarios

Characteristics of the pilot area
Status and trends of hydrological, geomorphological and biological process
Evolution dynamics in the Pilot area under Climate Change
Monitoring and information gap-filling strategies

Elements of the participatory process for the Pilot Area
Stakeholders involved
Design and implementation of the participatory process
Outcomes of the participatory process

Adaptation Plan
Jurisdictional framework
Identification of the vision for the Pilot Area
Action Plan for the Pilot Area (or Focus area)
Monitoring plan

WP5 - Elements of the participatory process for the Pilot Area

Synthesis of the participatory process:

Stakeholder engagement took place in two main ways:

1.by sending information material (3 **newsletters** via email) relating to the contents and progress of the CWC project

2.through the organization of three **workshops**: the first mainly informative, the other two aimed at discussion with and among the participants.

A third phase, at the specific request of local groups, consists in the development of an **educational campaign** for schools, on the themes of the CWC project, aimed at both students and teachers.

As part of the participatory process, together with the organization of the workshops, other stakeholder involvement activities were carried out:

- **questionnaire** on the perception of climate change;
- distribution of the presentations;
- publication of the material relating to the events on the regional institutional website and social network of the project;
- publication of articles on other relevant sites and local newspapers.

Stakeholders were contacted both by e-mail and by telephone before each workshop.

Action	Timing of the participatory process			
Mapping of stakeholders	*June-July 2019*			
Planning phase		*January 2020 - February 2021*		
Implementation phase			*March-June 2021 (first workshop on 23 April, second and third workshops 17 June and 18 June)*	
Analysis and finalization phase				*June-September 2021*

WP 5 - Elements of the participatory process for the Pilot Area

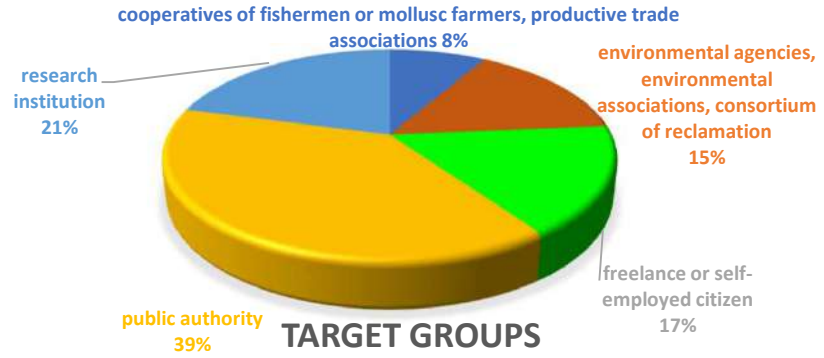
Stakeholders involved:

The most represented groups of stakeholders involved in the participatory process are those of economic operators in the fishing sector, and local administrators.

As regards public administrations, both the mayors and the technical officials of the municipalities of the Delta area, and those of the Province of Rovigo were contacted.

All the school offices in the area, the territorial offices of the main environmental associations, some professional associations, university researchers, as well as all the sector bodies that in various capacities participate in the management of the territory were also contacted.

Freelancers, regional officials from various sectors and other staff not directly contacted asked to participate in the workshops following the widespread publicity of the events through press releases.



Policymakers	**Veneto Region**
	Province of Rovigo
	Municipalities
Public adiministrations	Po District Basin Authority
	Reclamation Consortium of Delta Po
	Ministry of University and Research
	Ministry for Cultural Heritage, and for Tourism
	Superior Institute of Health
	Interregional Agency of Po River
	Regional Park Authority
Educationals	University (Ferrara and Padua)
	School Districts
	Museums
Researchers	National research council
	Italian Institute for Environmental Protection and Research
	Regional Agency of Environmental Protection
Associations	Professional association
	Italian bird protection league – Rovigo
	Legambiente - Rovigo
	World Wide Fund Rovigo
	Italian Association of Atmospheric Sciences and Meteorology
Economic trade associations	Coldiretti
	Confagricoltura
	Fishing and shellfishing consortium
	FLAG – GAC (Fisheries local action group – Chioggia and Po Delta), Coastal Action Group.
Fishing /shellfish farming Enterprise	Shellfishing farmers
	Fishermen
Other	Freelancers
	Companies
	Consulting firms
	Integrated water service managers
	Journalists

WP5 - Elements of the participatory process for the Pilot Area

Critical issues and *proposals* *that emerged from the participatory process mainly concern:*

- **conflict between European fisheries policies and local activities,**
- **conflict between tourist activities and environmental protection requirements,**
- **request for greater involvement of residents in the choices relating to the development of the territory and greater participation in the participation process.**
- **strong demand for training initiatives in the area.**

The common line that emerged during the discussion is to identify an adaptation strategy that follows natural tendencies of the area.

This is essential for the correct use of resources and for responsible and sustainable development. Above all, the need for more in-depth studies on coastal and marine natural dynamics emerged and a request for involvement and active participation.

WP5 - Elements of the participatory process for the Pilot Area

Main Results:

achieved by our stakeholders *from the participatory process*

- **Increase of knowledge, among stakeholders**, of the climatic effects and environmental scenarios in the Po Delta for the next decades.
- Achieving **awareness of the likely problems to be faced** in the future.
- **Knowledge of the European and national tools put in place** to start planning interventions for adaptation to climate change.

achieved by us *from the participatory process*

- The creation of a correlated series of **relationships** between the different actors.
- The **collection of contributions, ideas**, knowledge of the territory provided by local operators, relevant for the implementation of the subsequent planning phase.

ADAPTATION ACTIONS AND MEASURES

Proposal n. 9. Develop prevention actions against damage from extreme events, at the level of civil protection, such as monitoring systems and warning systems.

VISION	STRATEGY	GOALS	BODIES INVOLVED	LOCAL PLANNING
Health prevention	New monitoring and alert systems	Give the population time to get to safety in case of severe weather	Municipalities Regional civil protection Regional Environment Department Local civil protection volunteers	Municipal civil protection plan, Municipal emergency plan
Damage prevention	Maintenance of the building and trees	Limit accidents and damage due to strong winds	Municipalities Private citizens	PAT PAES
Damage prevention	Maintenance and reinforcement of embankments, barriers, expansion areas	Reduce the effects and damage due to floods	Regional civil engineering Soil Defense Directorate Reclamation consortia	Integrated Coastal Zone Management Regional planning and projects on the coast line

FOCUS: CIVIL PROTECTION

PROPOSED BY TARGET GROUP: PUBLIC BODIE

CRITICAL ISSUE: FLOODS AND STORMS

Proposal n. 10 For the Sacca del Canarin, the goal is to reverse the dynamics of environmental degradation caused by poor hydrodynamics, anoxia, and alteration of the salt balance. Its vivification will improve fish production and may lead to local tourism development.

VISION	STRATEGY	GOALS	BODIES INVOLVED	LOCAL PLANNING
Vivification of the lagoon	Hydro-morphological interventions (see specific project)	Increase fish production and shellfish farming	Regional Civil Engineering Regional fishing sector	Integrated Coastal Zone Management

FOCUS: ENVIRONMENTAL QUALITY

PROPOSED BY TARGET GROUP: FISHERMEN

CRITICAL ISSUE: DECAY OF CANARIN LAGOON

Proposal n. 5. Improve the information network and monitoring databases in the river-lagoon-sea context.

VISION	STRATEGY	GOALS	BODIES INVOLVED	LOCAL PLANNING
Create a long-lasting dataset in order to implement the forecast models already set up with the CWC project	Unique WEB site for the Delta	Shared knowledge of foreseen phenomena - scenarios	Higher Institute for Environmental Protection and Research (ISPRA) Institute of Marine Sciences (SMAR) Veneto Region Emilia-Romagna Region	
Share the results of the models with local representatives	Unique WEB site for the Delta	Shared knowledge of foreseen phenomena - scenarios	Higher Institute for Environmental Protection and Research (ISPRA) Institute of Marine Sciences (SMAR) Veneto Region Emilia-Romagna Region	

FOCUS: SHARING AND INTEGRATION OF ENVIRONMENTAL DATA

PROPOSED BY TARGET GROUP: TRADE ASSOCIATIONS

CRITICAL ISSUE: LOW EFFICIENCY OF FORECAST MODELS

WP5 - Elements of the participatory process for the Pilot Area

Summary sheet: n. TG - 2

TARGET GROUPS and SECTORS	STAKEHOLDERS
General Public. Fishing, aquaculture, shellfish farming.	Cooperatives of fishermen, and shellfish farmers.
HIGHLIGHTED CRITICALITIES	PROPOSALS
Over-exploitation of fisheries resources. As for the reduction of fishing effort (reduction of the authorized vessels in the context of management of particular kind of fishing), in accordance with the European directive, the Italian fleet has already been halved, but the catch has not increased, according to expectations. The measure introduced by the European legislation is considered useless or, in any cases, scarcely effective by sector operators. Changes in the structure of fish communities due to environmental changes linked to climate change (temperatures, salinity, pH, etc.), with effects on the type of fish. Variations in fish production: reduction from 720,000 tons to 250,000 tons in 20 years. Modification of the distribution area of some fish populations (for example: There was no Bluefin tuna in our area in the 70s, now there is - since the 80s and 90s.). Changes in the residence time of some fish populations (for example: The cuttlefish usually stayed in our areas for 2 or 3 months, now they stop for 10 days). Conflicts between species due to the increase of alien species (Pomatomus saltatrix). Increased frequency and incidence of extreme events that strongly impact on mussel farms.	It is a priority to identify and understand the real causes for variations in fishing production. It is essential to recognize the causes of the shrinking fish communities. It is important to identify which part is attributable to the CC. Change the production system based on changes in the marine environment. Reduction of conflicts (or their severity) between sea fishing and other persistent activities in the same areas (aquaculture, commercial and tourist navigation, installation of solid structures at sea for various purposes) thanks to better planning of marine spaces (Directive 2014/89 / EU). Increase information and training on changes due to CC.

WP5 - Elements of the participatory process for the Pilot Area

Summary sheet: n. **TG – 2 – Measures**.

SECTOR
Fishing, aquaculture, shellfish farming.
MEASURES
Development of web platforms for sharing information between fishing operators and other interest groups to facilitate the monitoring of activity at sea and the operation of "short supply chains" in the marketing of fish. Transition to new genetic varieties and management of practices more suited to changed conditions. Variations in new species may contribute to reducing the vulnerability of the sector to the effects of climate change, leading to a transition to more climate resilient organisms, which live better in different conditions. Economic or fiscal incentives aimed at diversifying activities, in compliance with the protection of fish stocks and marine resources, initiating a transition to new forms of activity (fishing tourism, farming in the sea). NOTE: The cost of developing techniques for the breeding of new species and the time required to bring these species to market constitute a significant obstacle, as well as legislative and management restrictions, which slow down change and flexibility.
REFERENCE REGULATORY FRAMEWORK
Member States are responsible for monitoring their fishing and related activities, while the EC checks how they fulfill their responsibilities. The sector is governed by Regulation (EC) no. 1224/2009 (regulation on control). It has been supplemented by regulation (EC) no. 1005/2008 relating to illegal, unreported and unregulated fishing (IUU regulation), and by Regulation (EU) no. 2017/2403 on the management of external fishing fleets, in a comprehensive package that integrates the responsibilities of EU Member States as coastal, port and marketing states. In addition, Directive n. 2014/89/EU establishes a framework for maritime spatial planning with the aim of promoting the sustainable growth of maritime economies (so-called blue economy), the sustainable development of marine areas and the sustainable use of marine resources. Legislative Decree n. 201 of 17 October 2016, implements Directive 2014/89/EU.

WP5 - Jurisdictional framework

The regulatory framework in the area is rather complex:

- The hierarchical levels are expressed integrally, from the municipal level to the European level;
- The regulated environmental areas are many, being a vast and diversified territory, which includes land, rivers, lagoons and the sea;
- The issues involved and consequently the constraints are many, due to the variety of resources, sometimes of national and supranational interest: gas extraction, power plants and power lines (now disused), small ports, wetlands of environmental interest, presence of large farms (fishing, shellfish farming) etc.

The national planning taken into consideration is as follows:

- **National strategy for adaptation to climate change (SNAC)**

SNAC provides a national vision on how to deal with the impacts of climate change in multiple socio-economic sectors and natural systems, identifying a set of actions and guidelines for adaptation.

- **The National Adaptation Plan (PNAC)**

It is an operational tool aimed at supporting national, regional and local institutions from a cognitive point of view in defining their own sectoral and local adaptation paths also in relation to specific criticalities.

Strategia Nazionale di Adattamento ai cambiamenti climatici

MINISTERO DELL'AMBIENTE E DELLA TUTELA DEL TERRITORIO E DEL MARE

Strategia Nazionale adattamenti climatici

National Plan for Adaptation to Climate Change

Structure of the Plan, its essential elements and the main stages of work

Identify:

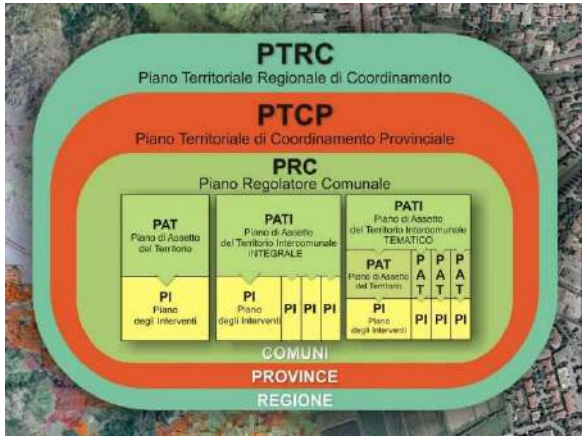
1. Reference climate scenarios at the district / regional scale;
2. Risk propensity
3. Sectoral impacts and vulnerabilities;
4. Sectoral adaptation actions;
5. Roles for the implementation of adaptation actions and measures as well as coordination tools between the different levels of government of the territory;
6. Estimate of the necessary human and financial resources;
7. Effectiveness indicators of adaptation actions;
8. Methods for monitoring and evaluating the effects of adaptation actions.

impacts	objectives	actions
Increased risk of erosion and flooding Sea level rise and conflicts of interest with the creation of structures coastal defense	Structural protection of the coast from the effects of rising sea, from the action of erosion and from storm events	ZC013. Promote a perennial ground cover ZC016. Maintenance of riparian and estuarial vegetation and dune areas ZC020. Elevation of the coastline ZC021. Construction of artificial dunes ZC025. Land conversion to coastal wetlands

WP5 - Jurisdictional framework

The local planning taken into consideration is as follows:

- Regional Territorial Coordination Plan (PTRC).
- Partial modification to the PTRC with attribution of the landscape value, "Adriatic coastal arch, Venice Lagoon and Po Delta".
- Regional Landscape Plan of the "ADRIATIC COASTAL ARCH FROM PO TO PIAVE".
- Area Plan of the Po Delta. Provincial Territorial Coordination Plan (PTCP).
- Environmental Plan of the Po Delta Park.
- Water Protection Plan.
- Water Management Plan.
- Territory Planning Plan.



Article 6	Scanni Directives Local authorities and competent authorities plan and carry out interventions aimed at the conservation, protection and restoration of the environment of the benches as identified in the project drawings. The defense of the benches should be favored with adequate maintenance	Loss of sandbars and consequent loss of habitat

Art 6

Scanni

Directives

Local authorities and competent authorities plan and carry out interventions aimed at the conservation, protection and restoration of the environment of the benches as identified in the project drawings. The defense of the benches should be favored with adequate maintenance aimed at consolidating the coasts with plantings of species suitable for the climatic and pedological characteristics of the area.

The municipalities arrange the tabulation of particular nesting sites or those characterized by the presence of nesting birds, guaranteeing their protection and regulating their protection and regulating their access by means of specific legislation.

	The province checks the areas relating to the oases with reference to the protected areas identified in this Plan.	

Article 14	Floodlands Directives Local authorities and competent authorities plan and carry out interventions aimed at the conservation, protection and restoration of floodplain environments, as identified in the project drawings. The municipalities arrange for the tabulation of particular nesting sites or those characterized by the presence of nesting birds, guaranteeing their protection and regulating access, also by means of specific legislation.	Loss of habitat and habitat of species.

Art 15

Senile riverbed of the Po

Directives

Local authorities and competent authorities plan and carry out interventions aimed at the conservation of the natural environment formed in the branches of the senile riverbed of the Po di Maistra and the protection of the flora and fauna species present.

The municipalities arrange for the tabulation of particular nesting sites or sites characterized by pre-seeds of nesting birds, guaranteeing their protection and regulating their access also by means of specific legislation.

	physical elements.	

Article 17	**Marsh wrecks** **Directives** **The municipalities, when adapting the urban planning tools to this Area Plan, in agreement with the competent authorities, plan and carry out interventions aimed at the conservation, protection and restoration of the marshy wrecks, as identified in the project drawings, providing also to regulate around these a suitable range of respect, in which small structures connected to cultural leisure or didactic activities can be located.**	**Loss of habitat and habitat of species.** **Economic factor reduction.**
Article 18	Embankments of historical and environmental value Directives The municipalities, when adapting the urban planning tools to this Area Plan, safeguard the embankments of historical-environmental value identified in the project graph on a scale of 1: 50000, as signs of the territory that must be maintained and enhanced. The municipalities and the Reclamation Consortium provide for the enhancement of these signs of land also through a reduction of the gaps that exist today and, for the hydraulic separation embankments, through appropriate planting with species typical of the places.	Lack of increase in the naturalistic and landscape ecological system, in addition to the maintenance of the hydraulic defenses and the historical testimony of the territory.
Article 20	Areas of environmental restoration Directives The municipalities, when adapting the urban planning tools to this Area Plan, establish specific rules for the protection and enhancement of the areas referred to in this article, as identified in the project drawings. In particular, they ensure: - favor the formation of nuclei of vegetation and arboreal and / or shrub wings, especially along the border with fossil dunes and wooded relics; - - prepare routes, panoramic points and small services for visitation tourism, to be carried out according to the procedures for landscape equipment, indicated in the attached operating aids or in the handbooks referred to in Article 5 of these regulations.	Lack of increase of environmental ecological systems and tourism enhancement.

Article 17	**<u>Marsh wrecks</u>** **Directives** **The municipalities, when adapting the urban planning tools to this Area Plan, in agreement with the competent authorities, plan and carry out interventions aimed at the conservation, protection and restoration of the marshy wrecks, as identified in the project drawings, providing also to regulate around these a suitable range of respect, in which small structures connected to cultural leisure or didactic activities can be located.**	**Loss of habitat and habitat of species.** **Economic factor reduction.**
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Art 23

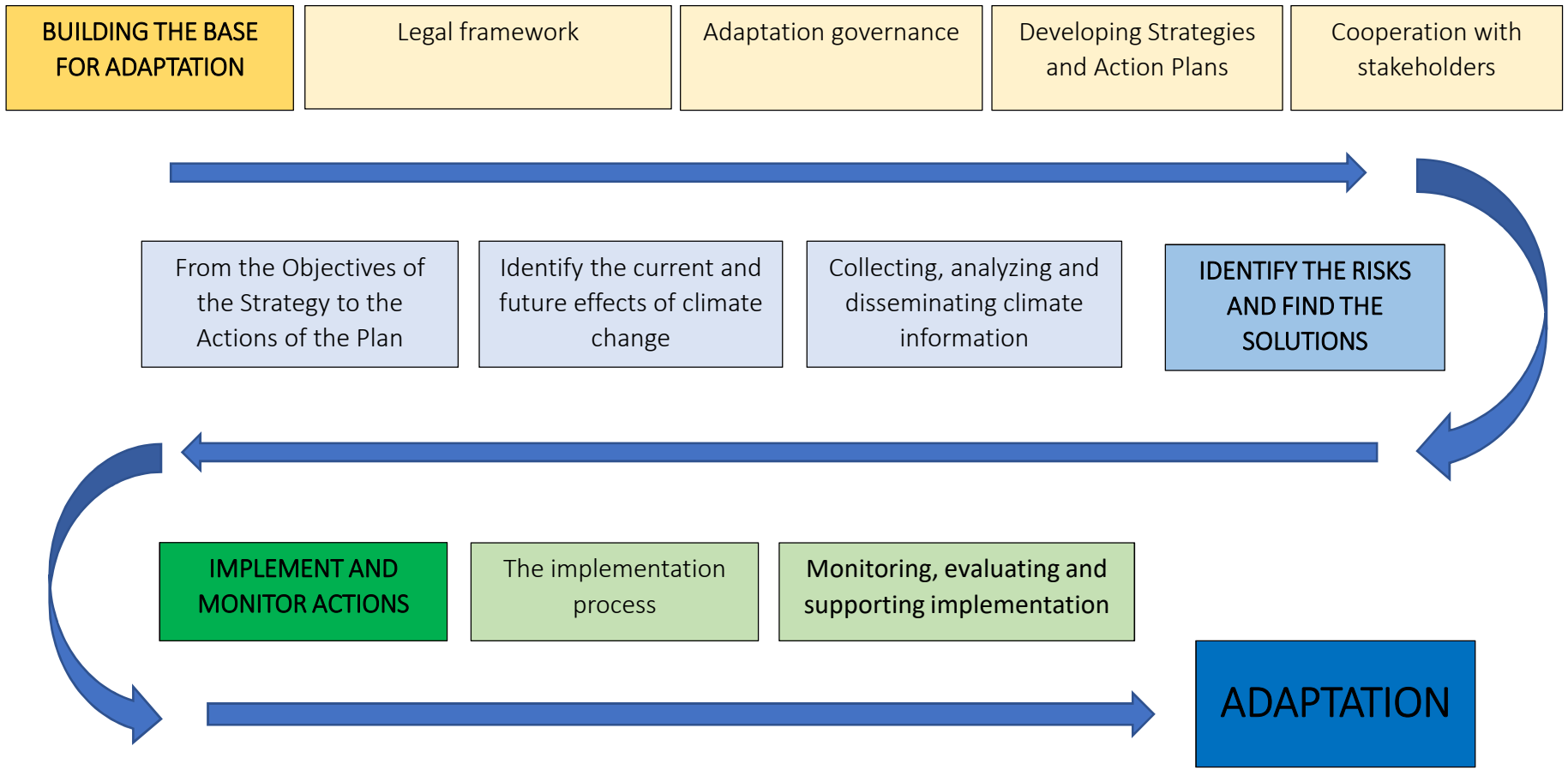
Areas of environmental landscape interest

Directives

When adapting the urban planning tools to this Area Plan, the municipalities prepare, for the areas included in the areas of landscape-environmental interest, as identified in the project drawings, an environmental regulation aimed at safeguarding both the buildings and the complex of elements constituting significant documents of the landscape; within these areas the municipalities also identify specific areas to be subjected to particular regulations for the purpose of protecting and enhancing the agricultural landscape. These areas are preferential areas for the construction of territorial parks.

The existing biotopes must be recognized and maintained (floristic emergencies, water bodies, groves, wetlands, etc.) and the environment must be enriched through interventions that provide for the improvement / increase or the creation of arboreal-shrub wings, along the perimeter wetlands, waterways and cultivated areas, with the exception of horticultural areas, in order to achieve a greater articulation of the vegetation that allows the reconstruction of biocoenoses associated with the agricultural landscape.…

WP5 - Adaptation Plans



Source: Methodologies for the definition of regional strategies and plans for adaptation to climate change (CReIAMO PA)

WP5 - Adaptation Plans

- **Legal framework for adaptation** to climate change aims to define the legal instruments that deal with the adaptation, understand the content and define the methods of implementation of what is indicated therein; allows also to identify, where possible, a legal basis of reference in support of the adaptation tools that are intended to be introduced.
- **Governancein the adaptation processes** provides indications on how prepare an adequate governance system to undertake the process towards the adoption of a strategy or an adaptation plan, and to manage them e monitor its implementation as well as, possibly, intervene with changes e additions.
- **Developing a Strategy and Action Plan** defines the structure and relationships between Adaptation Strategy, in which the strategic vision of an administration and the principles of adaptation it intends to follow, and the Action, instead responsible for the detailed identification of actions, for evaluation their technical and economic feasibility as well as the identification of necessary resources.
- **Starting cooperation with stakeholders** proposes schemes and evaluations for the identification and involvement of the actors most interested in each sector, i.e. the subjects most likely to be affected by the consequences of climate change.

- **Collecting, interpreting and disseminating climate information** provides guiding principles for the preparation of a climatic framework that forms the basis cognitive on which to elaborate the Adaptation Strategy, and which is of support to the decision makers of the Public Administration.
- **Identify the current and future effects of climate change** describes the various activities necessary to define a scenario of the impacts related to climate change: recognition of the effects of climate change, risk assessment, impact analysis.
- From **the Objectives of the Strategy to the Actions of the Plan** describes the process from definition of a strategic vision of one's own territory, of general objectives e specific objectives (Adaptation strategy), leads to the identification of actions to be implemented concretely (Action Plan), taking into account the identified risks in the previous stages.

- **The implementation process provides** guidance on how to: ensure the coordination and implementation of all stages of implementation of the process adaptation, classify the current adaptation level (baseline) and its periodic evaluation, integrate existing plans / programs or programs under preparation with the construction of sets of specific measures intended for adaptation, elaborate and innovative tools aimed at transversal interventions and / or actions specifications.
- **Monitoring, evaluating and supporting implementation** provides guidance on how to identify a set of indicators of adaptation to climate change reliable and populated over time and integrated into the overall monitoring of Plan / Program / Project of reference, and on how the evaluation ed orienting its purpose and results towards the improvement of programming in current and future.

CHANGE WE CARE

THANKS FOR THE ATTENTION!

Marina Aurighi

Veneto Region – Environment and Ecological Transition Directorate

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www.italy-croatia.eu/change we care

Climate change on the Mula di Muggia sandbank: present challenges and adaptation options

Autonomous Region of Friuli Venezia Giulia(RAFVG)
Antonio Bratus

On-line event| 11.11.2021

European Regional Development Fund

The pilot site test

Grado is a touristic island at the eastern part of the Marano and Grado Lagoon. The town has about 8.000 inhabitants but during the summer season this number increases at least three times; statistic data says that 1.355.334 is the number of presences in the accommodation facilities for the whole 2017.

The Banco Mula di Muggia is located in the Autonomous Region of Friuli Venezia Giulia

Interreg Italy - Croatia
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European Regional Development Fund

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REGIONE AUTONOMA FRIULI VENEZIA GIULIA

Sand bank

The Banco Mula di Muggia is a system of active and relict sand banks, which extend up to 2 km seawards.
It can be considered as a barrier-island system, an elongate accumulations of unconsolidated sediment that separate the open sea from a landward restricted basin.

Vulnerable environment

The system is really sensitive to sea-level rise and storm patterns, thus providing clues to understand changes through time

A1

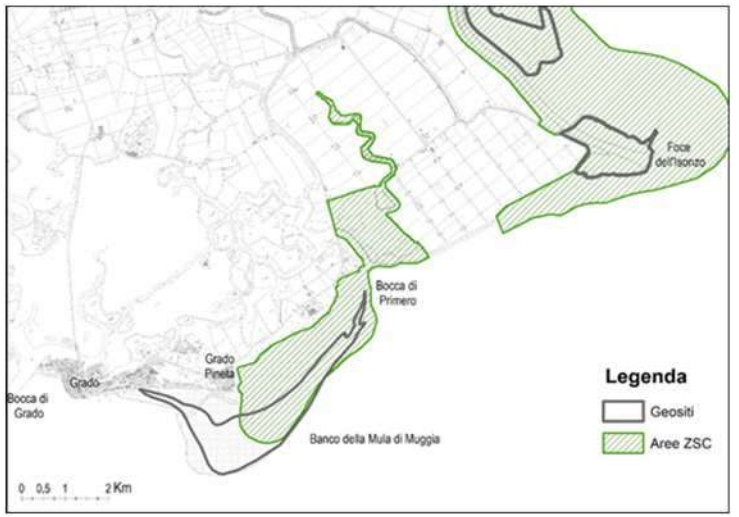
Diapositiva 4

A1 al posto di process ... understand ? interpret ?

Annelore; 10/11/2021

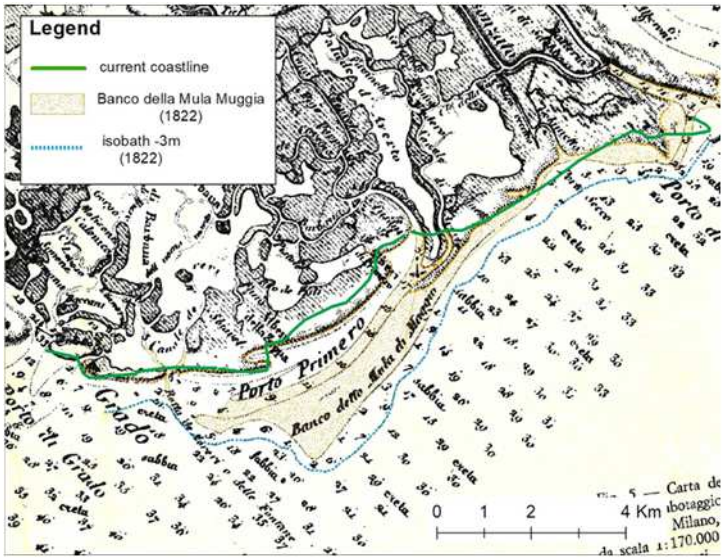
Tourism development vs nature protection

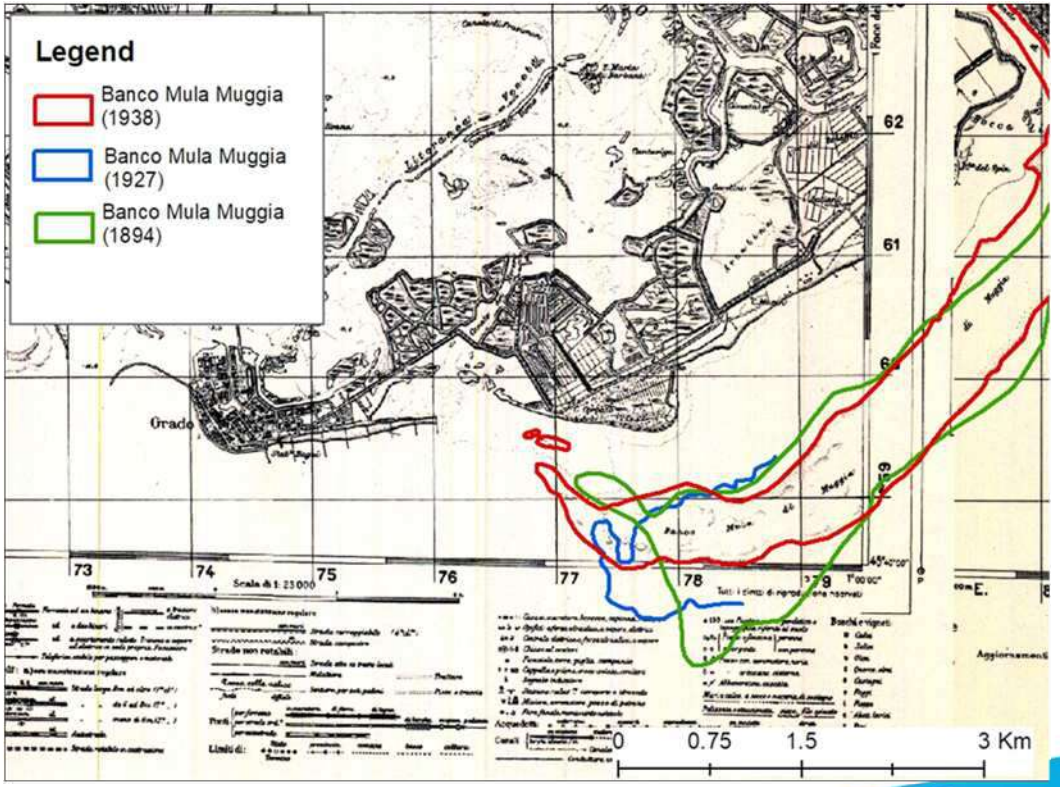
Two contrasting elements, such as an area for marine tourism development and a Natura 2000 site, coexist in the same area. Although the Banco Mula di Muggia is a wildness area for its geomorphological peculiarities, the onshore area is densely populated, especially in summer



A rapid and complex evolution

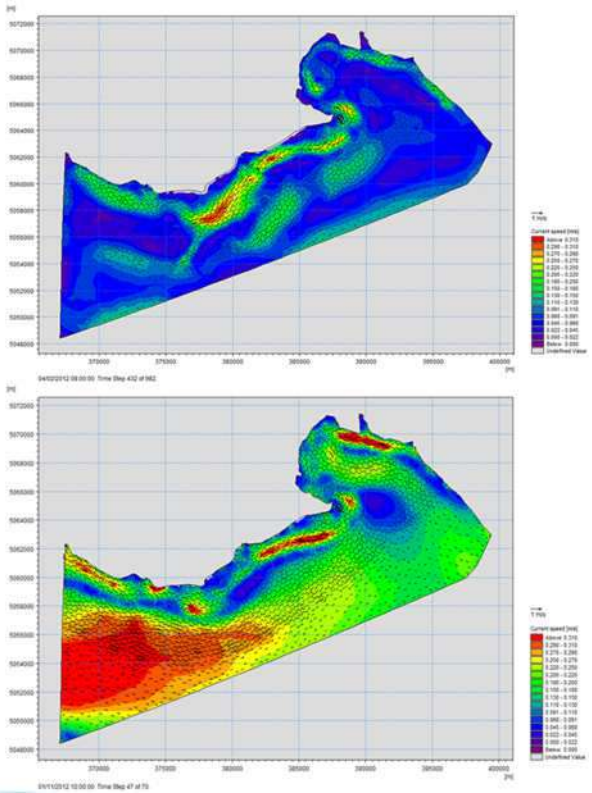
A cocktail of natural dynamics combined with important anthropogenic modifications

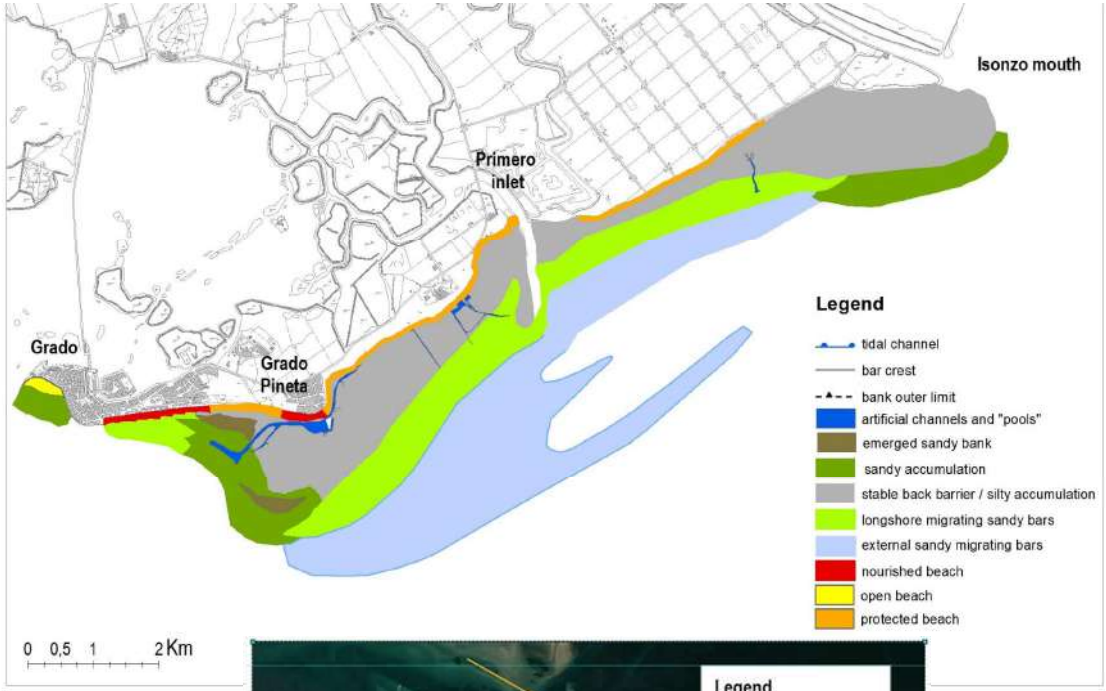


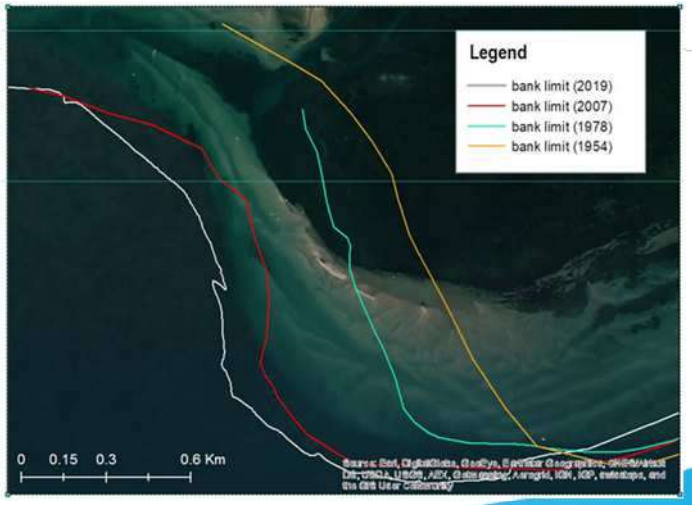


A sediment sink

The external sandy bars tend to migrate toward south-west, following the littoral drift generated by waves.







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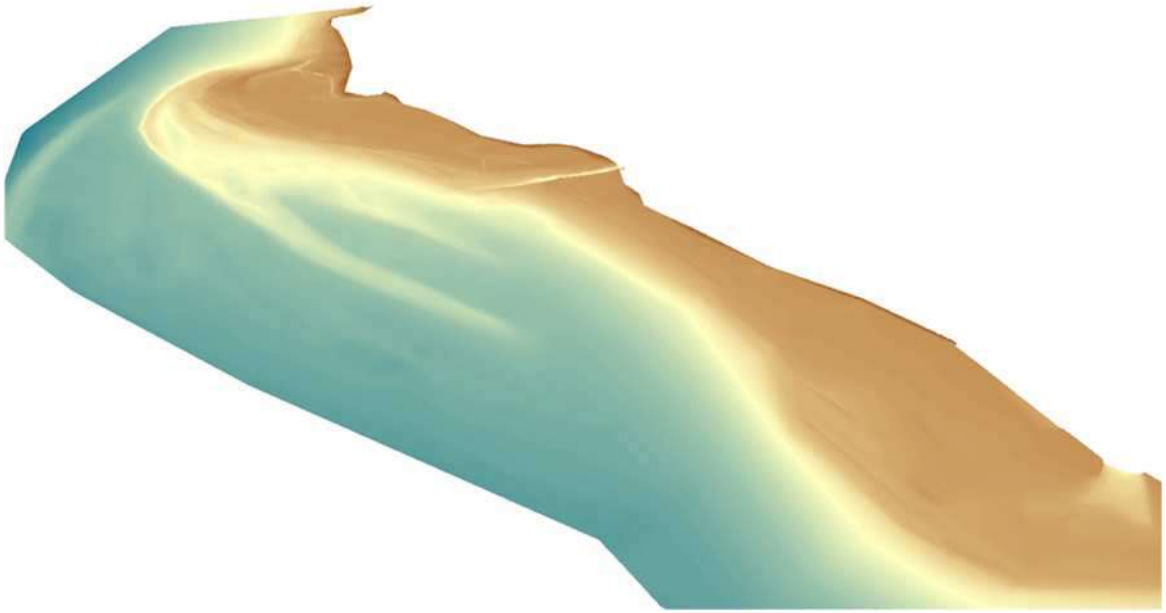
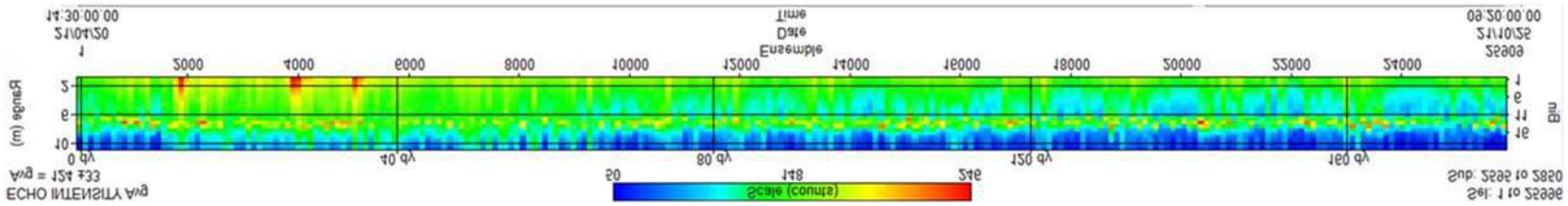
A project to know

Change we care helped to understand sediment dynamics





A project to know

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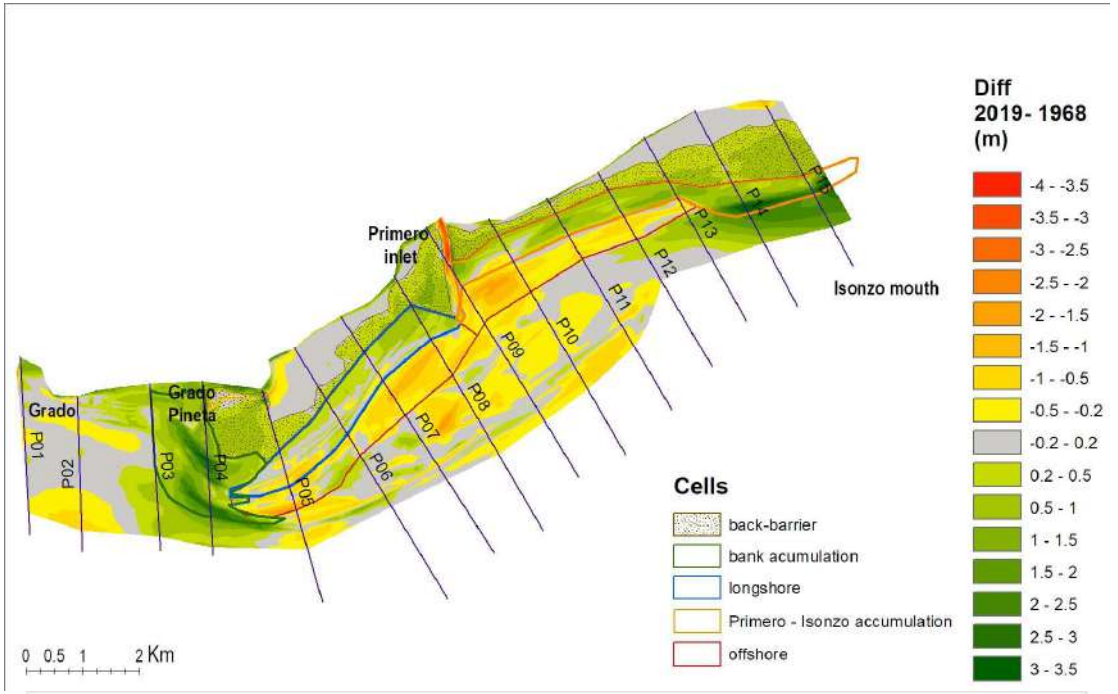

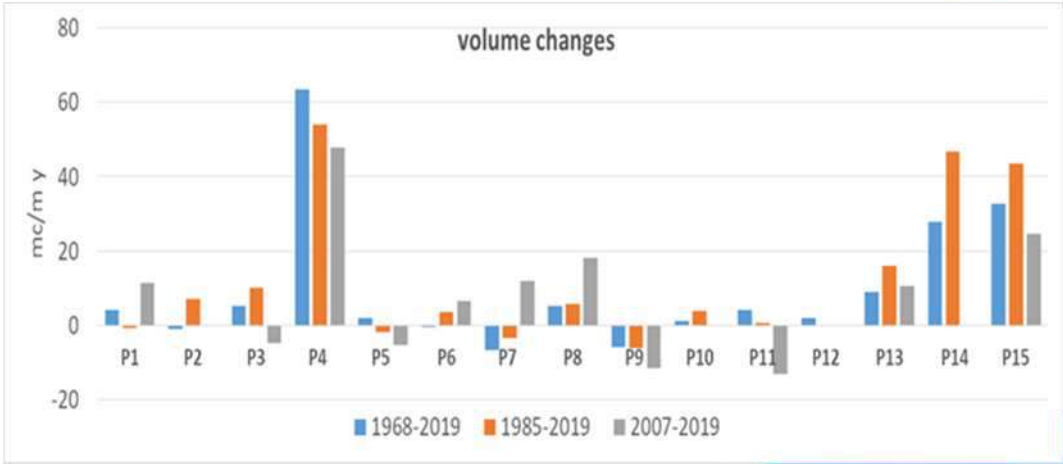

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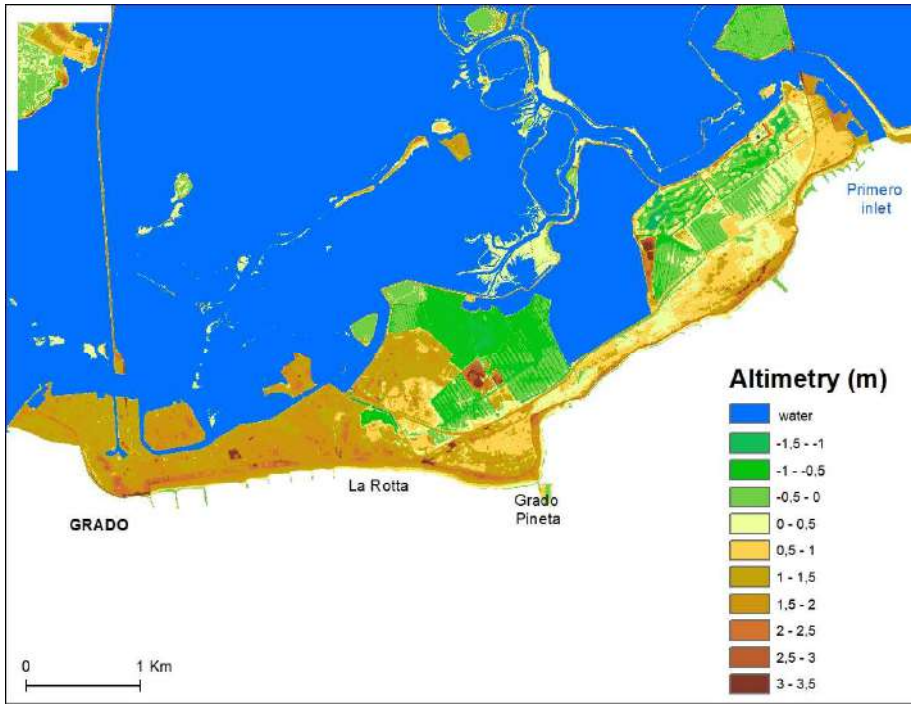
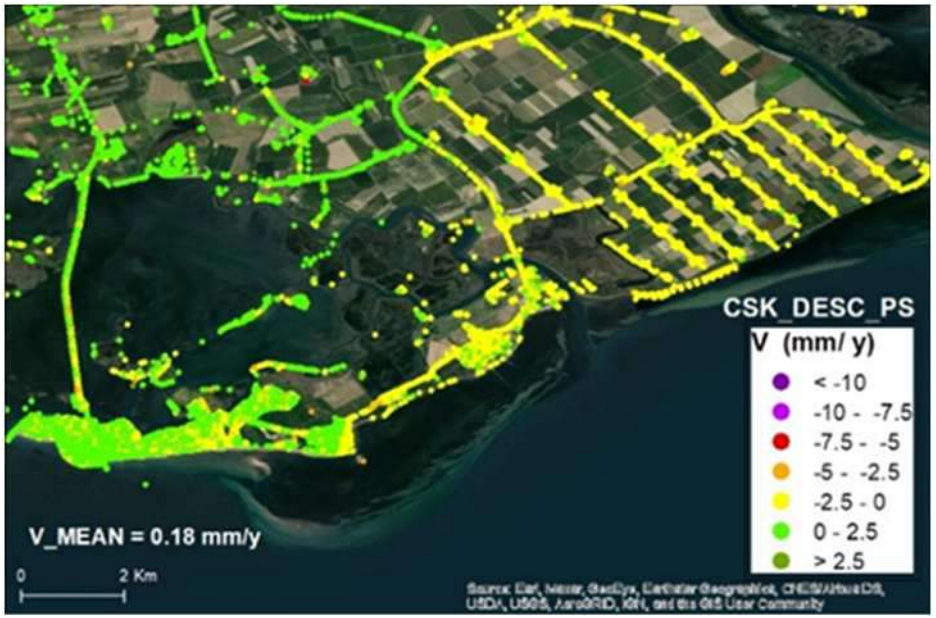
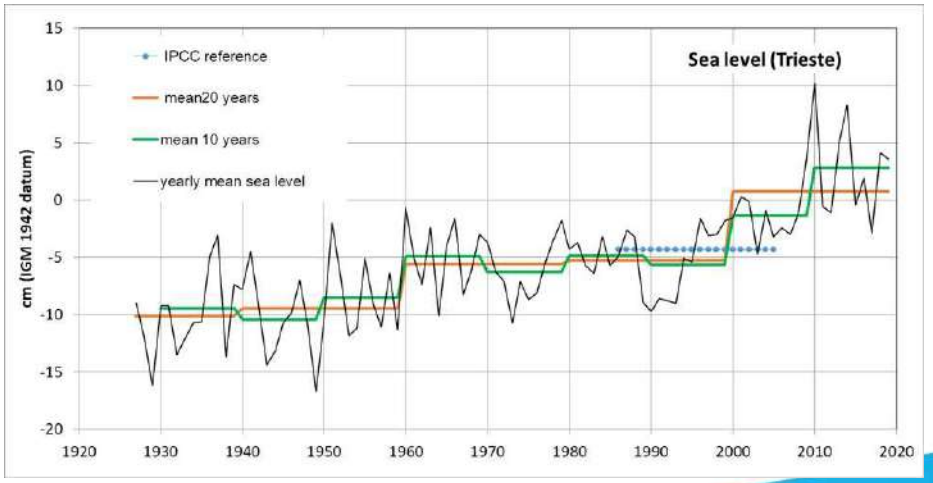
A project to know

Subsidence and sea level rise were compared







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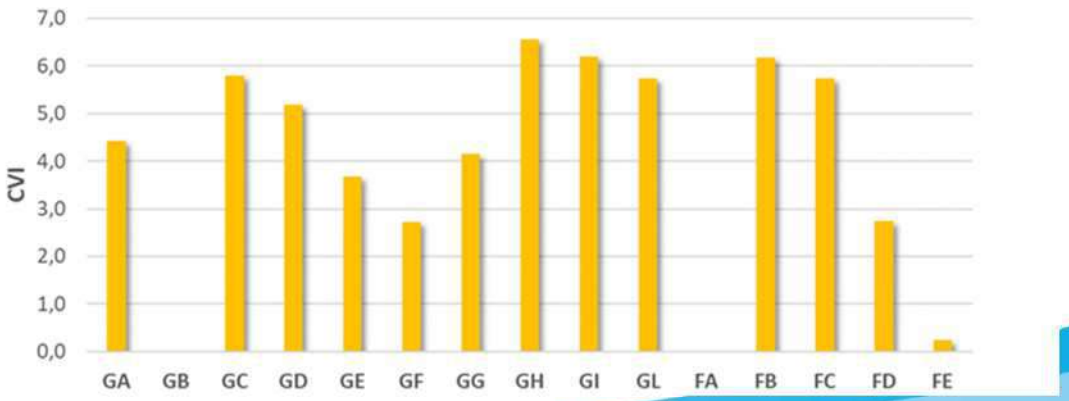
The short-term coastal vulnerability scenario

The coastal vulnerability analysis refers to the principle that vulnerability to flooding is strongly conditioned by the different characteristics of the coastal sectors and the consequent dissipative power of wave energy



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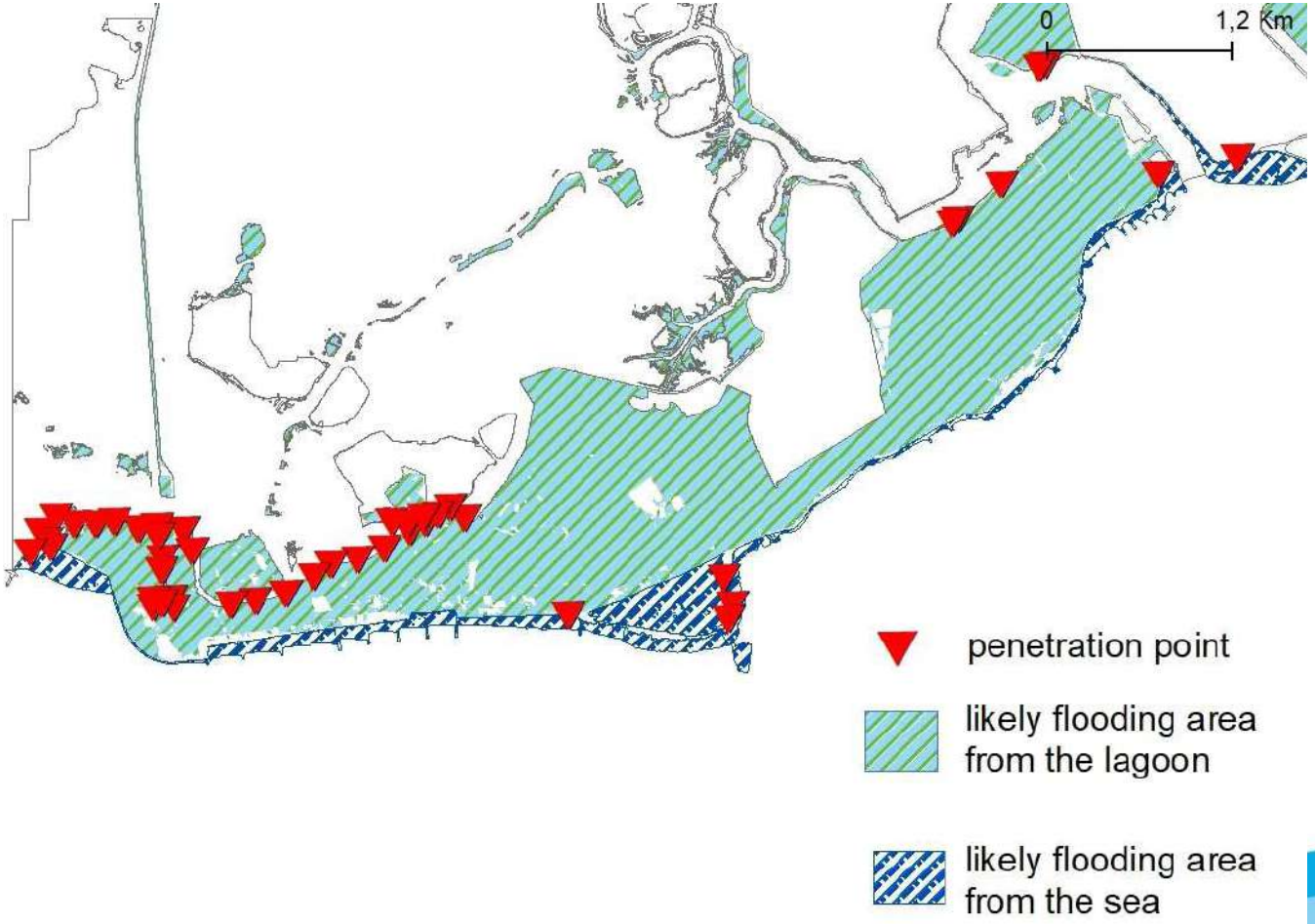
The long-term coastal vulnerability scenario

Different flooding models for RCP scenarios were obtained by imposing the respective sea level rise values on the DTM model

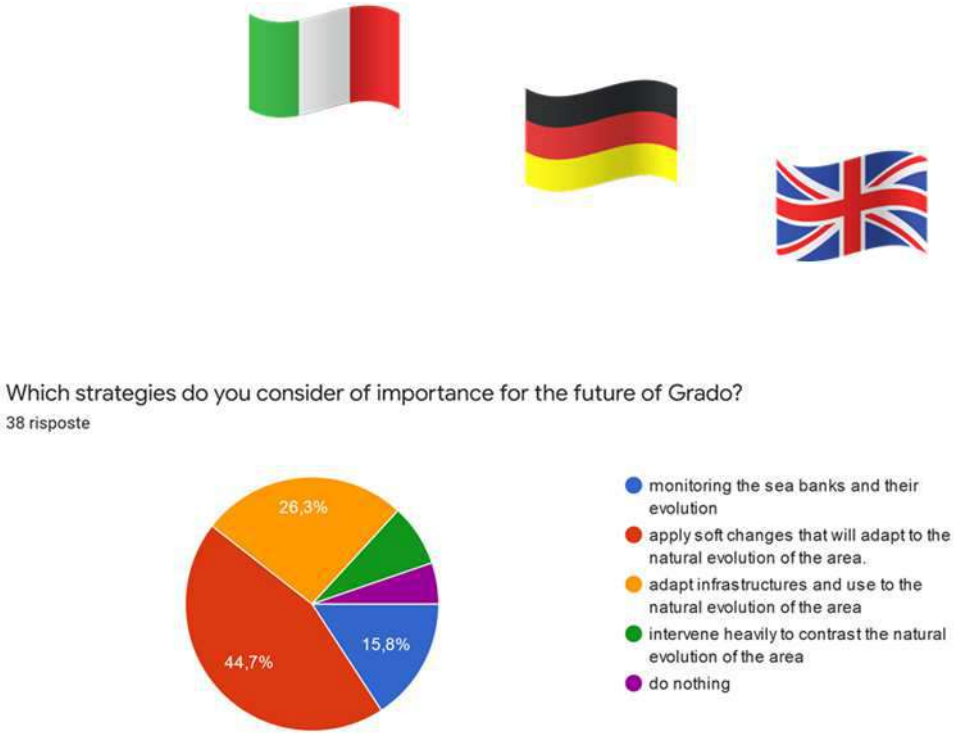
By adding to the sea level rise values, those for high water events (0.59 + 1.40), a potential almost complete flooding of the island of Grado is obtained



Strom surge condition and RCP 2,6 max (+1,99 m)

The participatory process

Two online events were organized with stakeholders



An online survey received 375 responses

Proposals for the future - Preserve

Monitoring

Rapid Environmental Assessment, REA

Proposals for the future – To preserve

Preserve the morpho-sedimentary system of the bank

Preserve the source of the sediments

The preservation of coastal natural environments responds to the objectives of the Green Deal

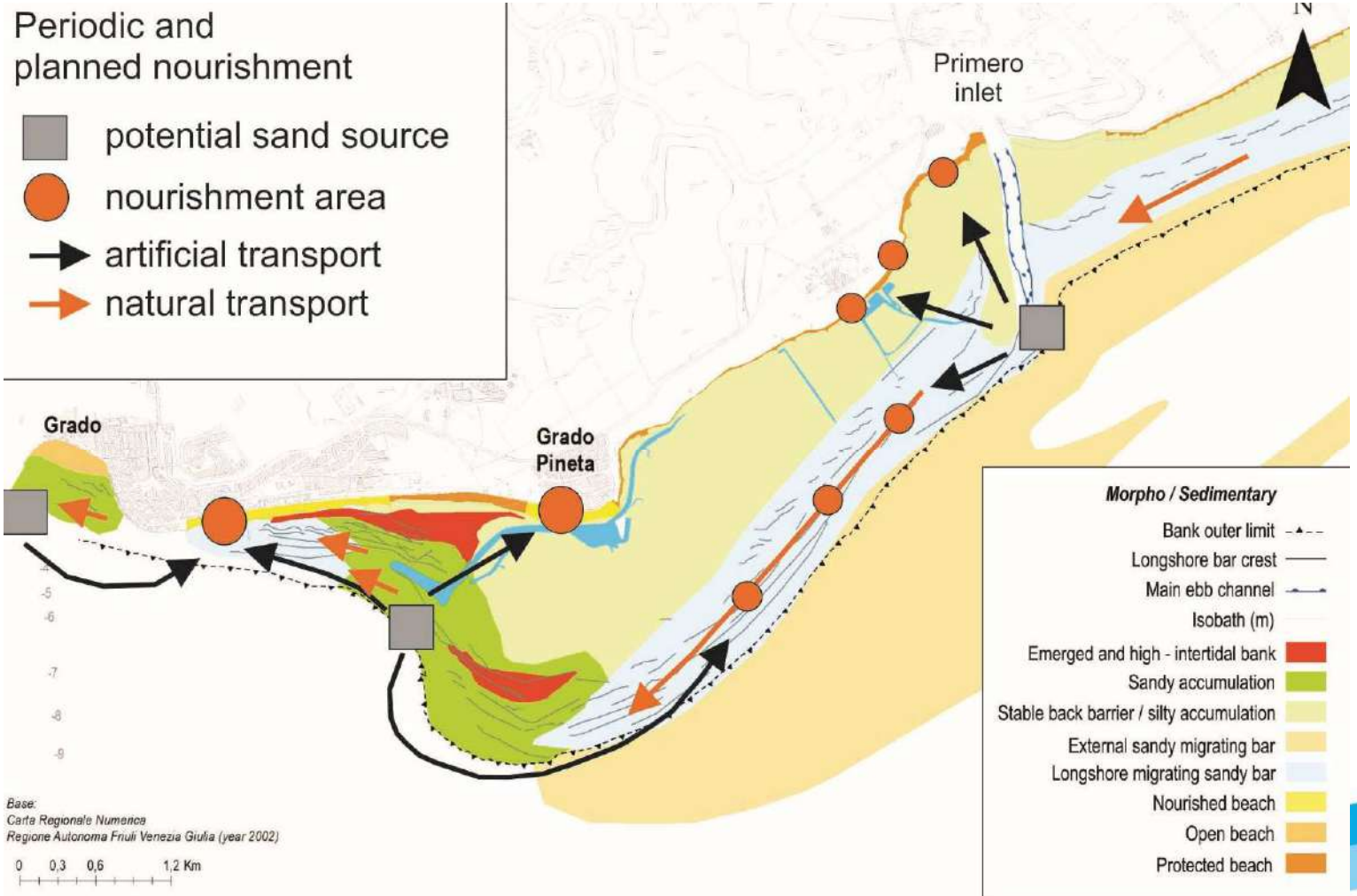
Proposals for the future – To do

Nature protection – kitesurfing regulation

Strengthening of defenses in vulnerable areas

Proposals for the future – To do

The overabundant sediments in these areas can be managed as a temporary reservoir for the nourishment of adjacent beaches, with the adoption of periodic and programmed dredging / nourishment



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Proposals for the future – To do

Natural pools and micro – ports, small interventions useful to improve the seaside tourist use of the protected beaches located in the rear barrier areas

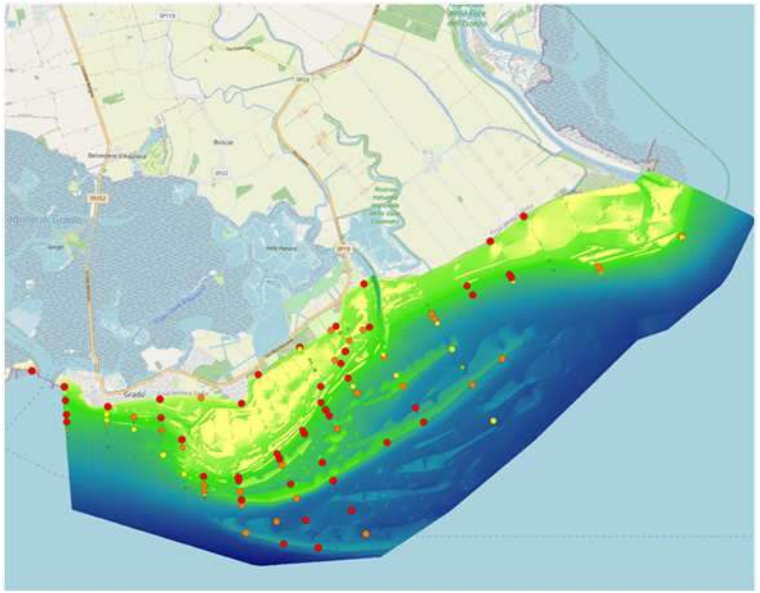
Education and information
to fill the lack of acceptance of the specific characteristics of the sites

The results came thanks to….

UNIVERSITÀ
DEGLI STUDI DI TRIESTE

dipartimento di matematica e geoscienze

Coastal Group



ALMA MATER STUDIORUM
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for Zaky

Communication Technology

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Development of the Joint Action Plan

CHANGE WE CARE | RERA| Mili Novak

Final Conference | On-line| November 11th, 2021.

Why Joint Action Plan?

- ✔ Mediterranean basin - "hot" climate point
- ✔ Significant and increasing risks during the coming decades
- ✔ Endangering the sustainable development of the society

Objective of the Joint Action Plan development

- ✔ accelerate climate action and ecological transformations
- ✔ reducing duplications and overlapping
- ✔ increasing synergies and improving focusing on priority needs of the two countries
- ✔ favourable environment for climate action

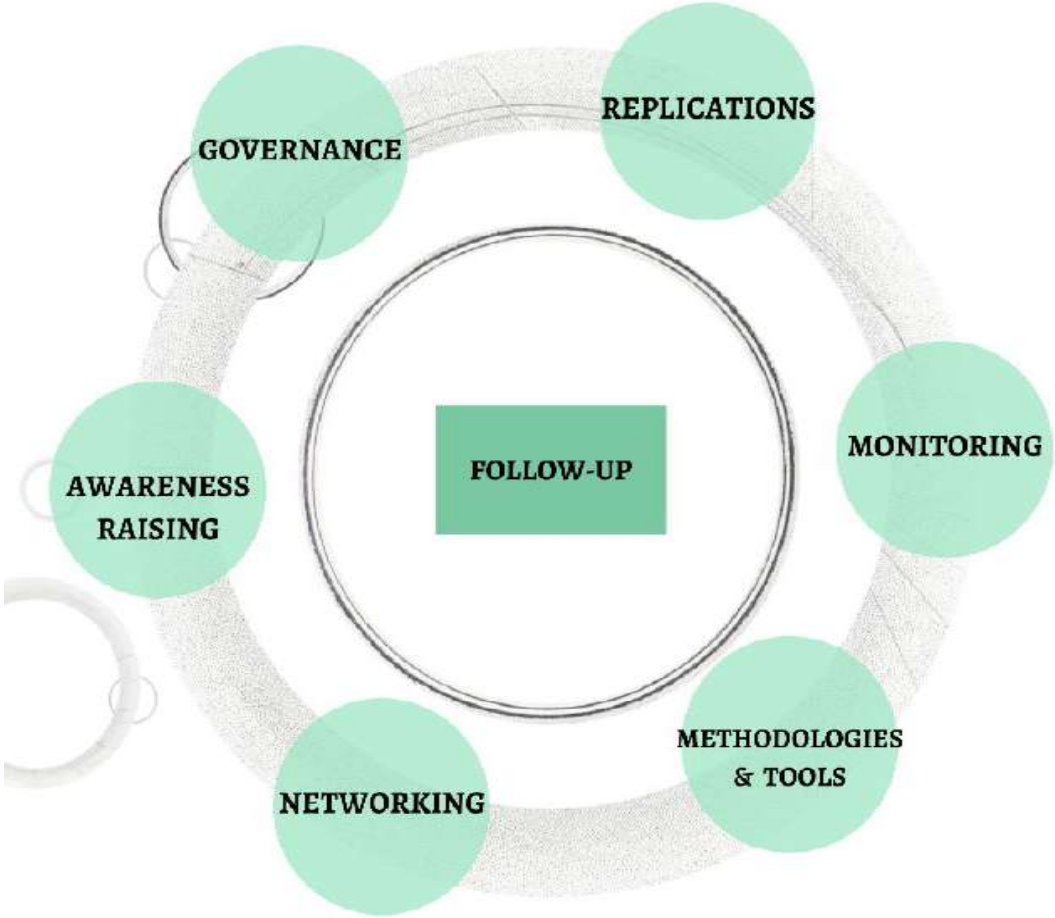
Proposal of the development process

The initiative was launched during the CHANGE WE CARE Mid-term Conference, in Kaštela/on-line, on April 13th 2021.

For this occasion 10 Interreg Italy – Croatia projects presented themselves, and announced their ideas for follow-up.

It was agreed that there is the need to improve collaboration in order to enhance capturing of the data collected and results obtained, as well as dissemination and exchange of experiences and good practices.

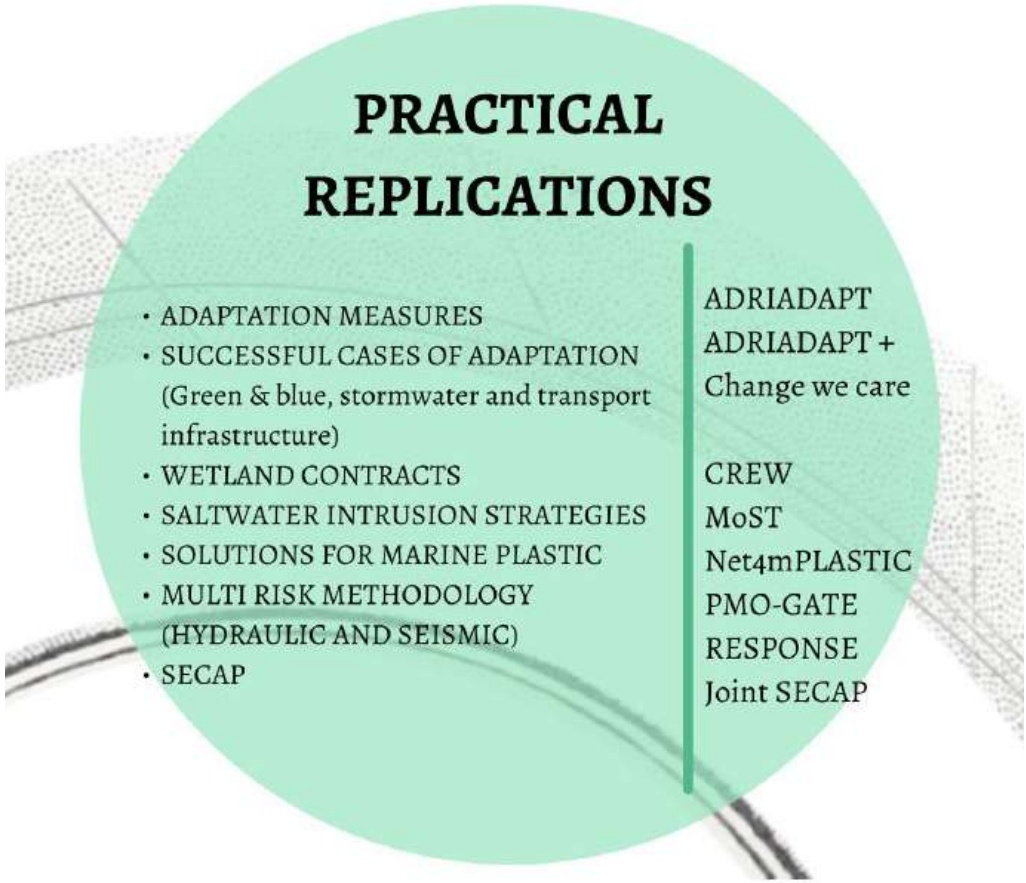
Structure of the Joint Action Plan



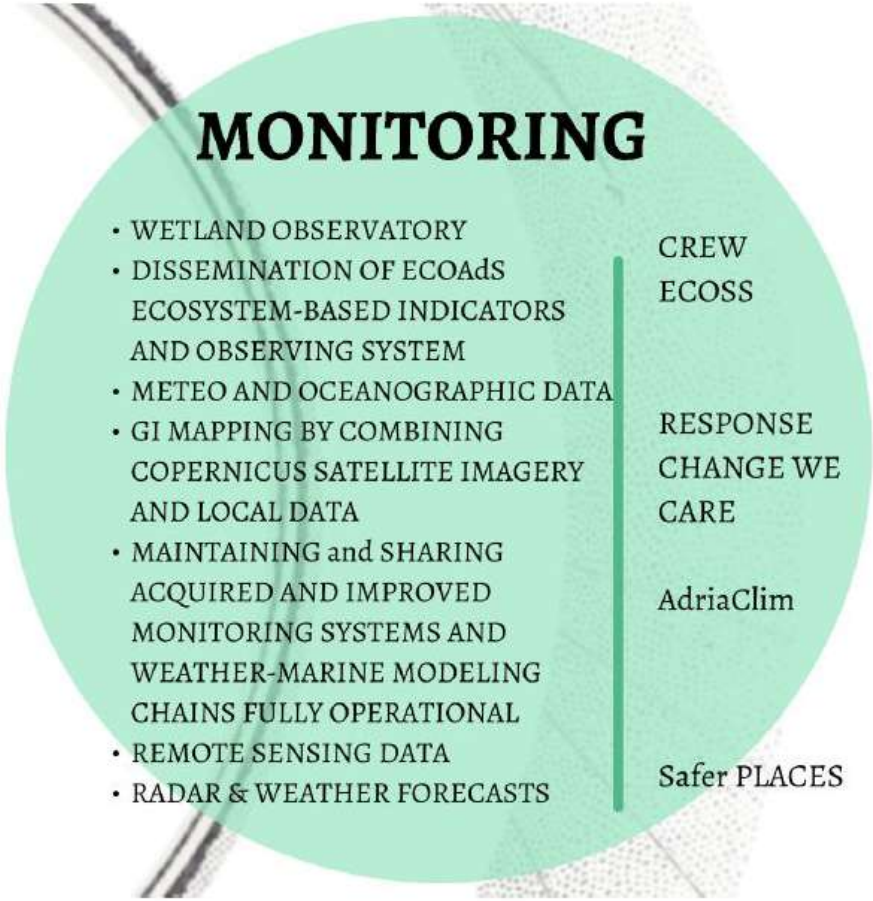
GOVERNANCE


GOVERNANCE
• GOVERNANCE FRAMEWORK FOR ADAPTATION (PARTICULARLY FOR SMALLER LOCAL AUTHORITIES)
• DEVELOPING SCIENCE/POLICY INTERFACE FOR ADAPTATION
• COORDINATE ONGOING ACTIVITIES AND PLAN FURTHER STEPS
• WETLAND CONTRACTS
• SUPPORT IMPLEMENTATION OF (COASTAL, ADAPTATION, ACTION, SECAP, INTEGRATED... PLANS)
• STRENGTHEN INTEROPERABILITY / INTEGRATION OF DATABASE PLATFORMS
• EARLY WARNING SYSTEMS
ADRIADAPT
AA+CWC
Change we care
CREW
AA+ CWC+
Joint SECAP
AdriaClim
SaferPLACES

REPLICATIONS

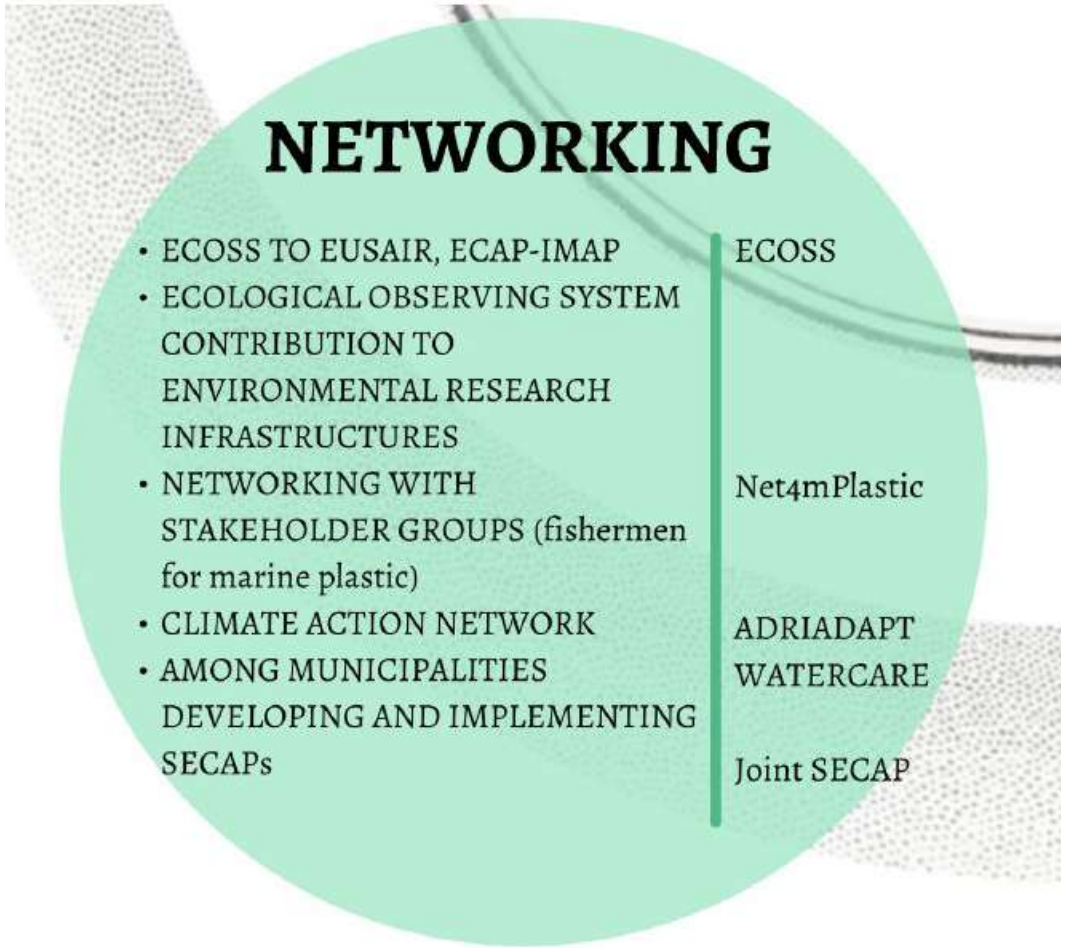


MONITORING


MONITORING
• WETLAND OBSERVATORY
• DISSEMINATION OF ECOAdS ECOSYSTEM-BASED INDICATORS AND OBSERVING SYSTEM
• METEO AND OCEANOGRAPHIC DATA
• GI MAPPING BY COMBINING COPERNICUS SATELLITE IMAGERY AND LOCAL DATA
• MAINTAINING and SHARING ACQUIRED AND IMPROVED MONITORING SYSTEMS AND WEATHER-MARINE MODELING CHAINS FULLY OPERATIONAL
• REMOTE SENSING DATA
• RADAR & WEATHER FORECASTS
CREW
ECOSS
RESPONSE
CHANGE WE CARE
AdriaClim
Safer PLACES

METHODOLOGIES, TOOLS, RESEARCH

NETWORKING


NETWORKING
• ECOSS TO EUSAIR, ECAP-IMAP
• ECOLOGICAL OBSERVING SYSTEM CONTRIBUTION TO ENVIRONMENTAL RESEARCH INFRASTRUCTURES
• NETWORKING WITH STAKEHOLDER GROUPS (fishermen for marine plastic)
• CLIMATE ACTION NETWORK
• AMONG MUNICIPALITIES DEVELOPING AND IMPLEMENTING SECAPs
ECOSS
Net4mPlastic
ADRIADAPT
WATERCARE
Joint SECAP

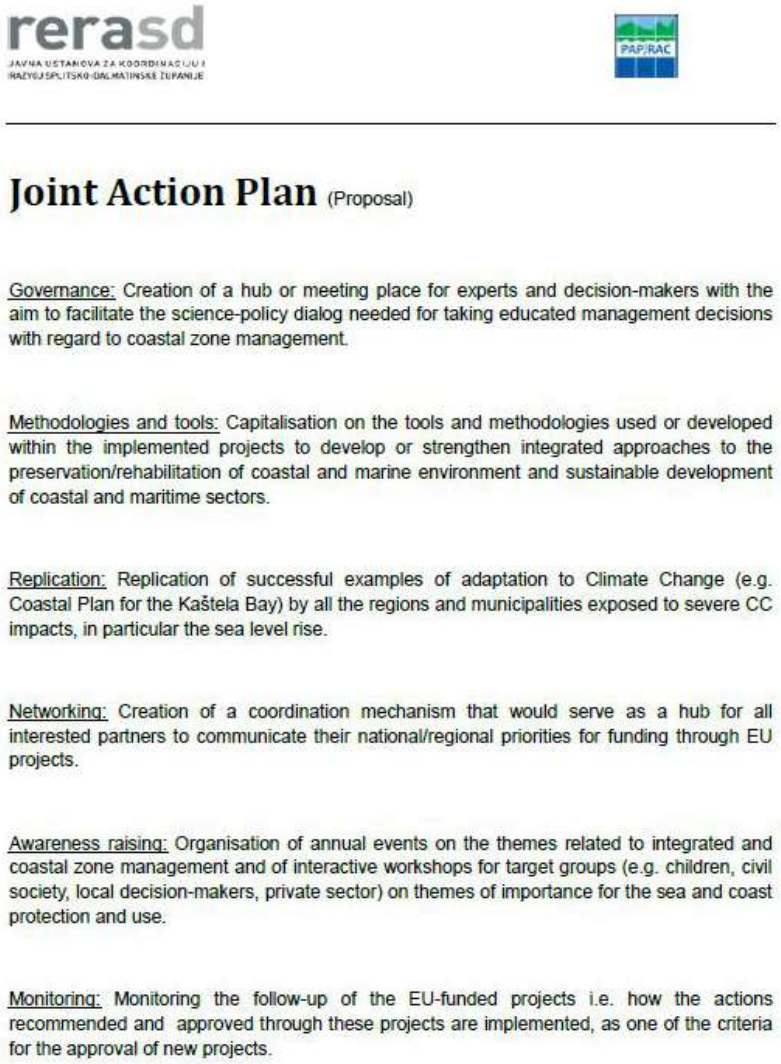
KNOWLEDGE AWARENESS

PRIORITY TOPICS

TOPICS: RESILIENCE & SAFETY

- governance / integrated coastal planning	ADRIADAPT
- adaptation / mitigation capacity building	ADRIADAPT / RESPONSE
- green infrastructure / spatial planning /GIS	CHANGE WE CARE
- wetlands	CREW
- marine biodiversity	ECOSS
- saltwater intrusion	MoST
- plastic pollution in the Adriatic	Net4mPlastic
- microbial contamination of Adriatic	WATERCARE
- multi-hazard risk management	PMO-GATE
-meteo-marine monitoring and modeling systems	AdriaClim
- flood/hazard risk maps and data / EWS	SaferPLACES

Joint Action Plan



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JAVNA USTANOVA ZA KOORDINACIJU I RAZVOJ SPLITSKO-DALMATINSKE ŽUPANIJE

PAP/RAC

Joint Action Plan (Proposal)

Governance: Creation of a hub or meeting place for experts and decision-makers with the aim to facilitate the science-policy dialog needed for taking educated management decisions with regard to coastal zone management.

Methodologies and tools: Capitalisation on the tools and methodologies used or developed within the implemented projects to develop or strengthen integrated approaches to the preservation/rehabilitation of coastal and marine environment and sustainable development of coastal and maritime sectors.

Replication: Replication of successful examples of adaptation to Climate Change (e.g. Coastal Plan for the Kaštela Bay) by all the regions and municipalities exposed to severe CC impacts, in particular the sea level rise.

Networking: Creation of a coordination mechanism that would serve as a hub for all interested partners to communicate their national/regional priorities for funding through EU projects.

Awareness raising: Organisation of annual events on the themes related to integrated and coastal zone management and of interactive workshops for target groups (e.g. children, civil society, local decision-makers, private sector) on themes of importance for the sea and coast protection and use.

Monitoring: Monitoring the follow-up of the EU-funded projects i.e. how the actions recommended and approved through these projects are implemented, as one of the criteria for the approval of new projects.

As conclusion

Investing in adaptation today will reduce the cost of repairing possible damages in the future.

It is of priority importance to:

- ✔ start the social process of accepting the concept of adaptation to climate change,
- ✔ determine the effect of climate change on coastal zone,
- ✔ determine the degree of vulnerability,
- ✔ determine priority measures.

Thank you!

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