

ENGLISH EDITION 

2 Seas Magazine

SPECIAL FOCUS

INTERREG IV A 2 MERS SEAS ZEEËN

SEPTEMBER 2014



A cluster initiative:

PRIME-C

Partnering for Risk Management and
Engagement on the Coast

2 Mers Seas Zeeën

INTERREG IV A

FRANCE - ENGLAND - VLAANDEREN - NEDERLAND



Programme de coopération transfrontalière 2007-2013 cofinancé par le **FEDER**
Cross-border cooperation programme 2007-2013 part financed by **ERDF**
Programma voor grensoverschrijdende samenwerking 2007-2013
medegefinancierd door **EFRO**

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Lord Chris Smith

Our coastal zones are some of the most beautiful, diverse, productive and dynamic places in Europe. As vibrant locations for visitors and industry with essential space for biodiversity, coastal communities are vital to our economy and wellbeing.

With the wealth of resources in coastal areas come risks and challenges that are not always shared by our inland counterparts. Work through European partnerships has recognised increasing coastal vulnerability to the impacts of environmental, social and economic change. While these areas have always experienced change, the rise in its rate and scale over the next century, and beyond, will put considerable pressure on people, ecosystems, infrastructure and property.

As seen over the past winter, coastal areas will have to become more resilient to physical risks including more frequent extreme weather, rising sea levels, increased rates of coastal erosion, hotter and drier summers and invasive species. The Intergovernmental Panel on Climate Change (IPCC) has reported that the rate of sea level rise since the mid-19th century has been faster than during the previous 2,000 years. Sea level rise over the last two decades has been around 3.2 mm per year – nearly twice the average rate from 1901 to 2010.

These risks require us to take a collaborative approach across Europe. For example, the localised management strategies used in the past may not always be effective options in the future. Regional food production and water security are likely to become higher priorities, while a buoyant tourism industry and innovative low-carbon sector may benefit from the changing environment. We must prepare and adapt, to reduce our exposure to these risks and make the most of any future opportunities. Planning is the key. The impact of decisions we make today will be felt far into the future.

The European Union is supporting long-term coastal risk management through integrated coastal management, marine spatial planning legislation and through funding Interregional programmes. As part of this on-going effort, the Partnering for Risk Management and Engagement on the Coast (PRIME-C) cluster, funded through the INTERREG IVA 2 Seas capitalisation actions, builds on over six years of experience and expertise in coastal management and community engagement to help us move forward towards a sustainable and prosperous future.

PRIME-C demonstrates how long-term planning can influence decisions and provides best practice examples for implementing risk management across the 2 Seas area. This publication makes clear how embracing the opportunity to work cooperatively increases our knowledge and resilience. It encourages a holistic and long-term approach rather than only looking to solve immediate concerns. Working in this way encourages coastal communities to maximise their opportunities and minimise their risks, bringing improvements to health, wellbeing, ecosystems and the economy.

A handwritten signature in blue ink, appearing to read 'Chris Smith', written in a cursive style.

Lord Chris Smith
Chairman of the Environment Agency
England



Oostende, Belgium. ©Christine Wissink

Coastal areas across the English Channel and North Sea provide abundant opportunities to the people who visit, work and live in them. They offer fascinating amenities, innovative industries, productive agriculture and dynamic places to call home. They are also some of the most important regions for nature conservation, including world heritage and Natura 2000 sites, marine conservation zones, special designations and beautiful protected landscapes. However, with such richness and potential comes increased competition for limited resources and space.

Within and across the four Member States cooperating in the INTERREG IVA 2 Seas Programme Area (United Kingdom, France, Belgium, The Netherlands), there are growing pressures on coastal zones from a range of environmental, social and economic issues. For example, climate change is

putting people, property, wildlife and water resources at risk, while invasive species are threatening native populations of flora and fauna. Also, coastal communities are getting progressively older and dependent on seasonal economies. These changes highlight the need for effective and collaborative risk management practices across Europe to allow these fragile regions to adapt and prosper. *PRiME-C*, which stands for Partnering for Risk Management and Engagement on the Coast, is a cluster joining nine projects and partners to establish current best practices in coastal risk management and engagement in the 2 Seas area.

PRiME-C achieved its primary aims of sharing results, testing new approaches and disseminating knowledge using the context of Integrated Coastal Zone Management (ICZM). In connecting

a diverse network of experts, projects and disciplines throughout the 2 Seas area, *PRiME-C* partners established three core principles vital to holistic cross border coastal risk management:

- Gain a firm understanding of environmental risks;
- Proactively plan to adapt to change; and
- Encourage local ownership of risk through participative engagement of communities and wider stakeholders.

Partners also recognised gaps in how information on coastal risk management is shared and used, particularly how data from different disciplines are collected and disseminated depending on the Member State.

This publication brings together the knowledge gained by the cluster partners and builds on learning from their INTERREG projects. It promotes cross border best practice techniques, methods and tools for designing and implementing coastal risk management programmes and for actively involving stakeholders in these processes. Inside are examples such as multi-dimension frameworks for identifying risk, strategies for community-led planning and systems for using historic data and local people to monitor change. There is a wealth of resources and evidence from INTERREG projects and clusters available to coastal managers in the 2 Seas area. These resources are part of the legacy of the INTERREG IVA 2 Seas Programme and will help launch risk management initiatives in the future.

CHAPTER 1

Partnering for Risk Management and Engagement on the Coast



PRiME-C Partners at Cap Gris Nez, France. ©Christine Wissink

Coastal areas are at the front-line of change with coastal sustainability issues having far-reaching implications that do not conform to political or geographic boundaries.

As the four Member States and coastal communities within them share a maritime border, the “2 Seas” of the English Channel and North Sea, open cross border co-operation is crucial to better manage change and increase resilience and prosperity. Since 2007, the INTERREG IVA 2 Seas Programme has prioritised “promoting and developing a safe and healthy environment.” This has resulted in numerous projects established on the understanding that risk management and

sustainable development are best achieved, not in isolation, but by working with neighbouring communities.

PRiME-C was developed to bring together the experience and expertise gained through nine of these projects in order to holistically address issues affecting the coastal region. The aim of the cluster was to identify lessons and best practices to share and implement throughout Member States.



Developing a network of experts: PRiME-C partners and projects

Nine partners joined the cluster for the unique opportunity to combine their diverse areas of experience in creating a robust network of experts and trial cross-discipline ways of achieving integrated, cross border, coastal zone risk management. The participating organisations represented three sectors (public authorities, academic institutions and businesses) and all four Member States making a “triple helix” which enabled and catalysed holistic results. **Bringing these partners together helped to remove boundaries between disciplines,**

sectors and geographic areas, and encouraged creative thinking and cross-fertilisation of ideas.

This particular partnership also represented a wide range of practical INTERREG projects. Each of the nine projects in the PRiME-C cluster addressed different specific problems within environmental, social and economic disciplines, and focusing on complementary elements of risk management and engagement. One partner did not represent an INTERREG project but joined the cluster to contribute a sci-

entific viewpoint in coastal studies and interdisciplinary approaches to coastal problems. The recent implementation of these projects produced an array of valuable experience in risk management: from strategic to ground-level, international to local, academic to practical, and past to future work.

PRiME-C therefore offers learning from current projects and robust best practice which is transferable across sectors, stakeholders and Member States.



PRiME-C Partners in Renesse, Netherlands. ©Christine Wissink

Partner	Area of Expertise	Outcomes from cross border working
Kent County Council	Sustainability, climate change and the natural environment. Supporting local authorities, communities and businesses to increase their resilience to future change while minimising their impact on the environment.	<ul style="list-style-type: none"> - Established STEM (Steps to Environmental Management) Programme - Identified Community Adaptation Action Plans and Visions - Developed a method for characterising seascapes
Alterra Wageningen UR	Qualified and independent research to promote the realisation of a high quality and sustainable green living environment.	<ul style="list-style-type: none"> - Developed a Marine Spatial Planning Framework - Created "atelier" Workshops - Planned an integrated coastal vision to increase spatial quality
Provincie West-Vlaanderen	Territorial development, climate change and landscape development. Supporting local coastal authorities with sustainable development of the area and improving co-ordination, planning and management of the coastal zone.	<ul style="list-style-type: none"> - Developed a Marine Spatial Planning Framework - Created "atelier" Workshops - Planned an integrated coastal vision to increase spatial quality
Département du Pas-de-Calais	Local sustainable development of Pas-de-Calais, including its coastal area. Supporting local rural authorities and communities. Protection and preservation of sensitive natural areas.	<ul style="list-style-type: none"> - Agreed an Implementation Plan for the Dover Strait - Led the monitoring of the Deux-Caps site management plan
University Lille 1 TVES Research Center	Geography and planning, environmental geography, social geography, sustainable development, coastal studies, urban planning and urbanism, nature management, natural hazards, vulnerability, coastal risks, risk management, Integrated Coastal Zone Management.	<ul style="list-style-type: none"> - Created a model for understanding multi-dimensional coastal vulnerability - Studied social perception of coastal risk
Maritime Archaeology Trust	Marine, inter tidal and near-shore archaeology and heritage, specialising in their relationship to, and potential to inform on, coastal and climate change. Undertakes research, education and dissemination in addition to provision of contractual services.	<ul style="list-style-type: none"> - Assessed the potential of historical resources to inform understanding of coastal change - Developed 2, 3 and 4D models to demonstrate long term coastal change - Produced a guide to using these resources in coastal management Produced a portal to make this data and the results accessible online
Environment Agency	Climate change, water quality and water resources. Risk of flooding from main rivers, reservoirs, estuaries and the sea. Increasing the resilience of people, property and businesses to flooding and coastal erosion. Supporting sustainable growth by working with organisations to manage use of resources.	<ul style="list-style-type: none"> - Designed community action plans and visions - Protecting and improving water, land and biodiversity - Produced Best Practice Guide to Coastal Adaptation
Norfolk County Council	Biodiversity conservation and monitoring, with a particular focus on non-native invasive species management. Bridging the gap between high-level policy and local action.	<ul style="list-style-type: none"> - Established Technique to assess area vulnerability to invasive non-native species (INS) - Development of new tools and approaches for management of INS through field trials and demonstrations
Gemeente Schouwen-Duiveland	Policy- and decision-making in the fields of local responsibilities of municipalities, such as spatial planning, environment, social affairs and economic affairs.	<ul style="list-style-type: none"> - Established Framework to assist ports in regenerating into new harbours and marinas with support from local communities



INTERREG IVA 2 Seas
Programme Area
© INTERREG IVA
2 Seas Programme

Six INTERREG IVA 2 Seas projects were integrated into PRiME-C:



Coastal Communities 2150 (CC2150) engaged communities and local residents in areas at particular risk of climate change on the coast. It raised awareness and understanding of the long-term risks and opportunities from coastal change by encouraging local community involvement in decision-making and preparation for the future.



Combining Sea and Coastal Planning in Europe (C-SCOPE) improved the co-ordination, planning and management of the coast, creating a “seamless coastal and marine planning framework” to suit the demands of professional and non-professional users.



Reducing the Impact of Non-native Species in Europe (RINSE) focused on improving the management of invasive, non-native species across the 2 Seas Programme area. It increased awareness of the threats they pose, and developed and promoted better ways to control and eradicate invasive species.



Arch-Manche demonstrated the value of using the rich archaeological, artistic and maritime heritage of the 2 Seas area as a resource to support the understanding of long-term coastal change and its impact on human settlement.



Fusion promoted sustainable business development among Small and Medium Enterprises (SMEs) and promoted the development of environmentally responsible enterprise by supporting SMEs to benefit from eco-innovation. The project worked to identify, test and implement a range of innovative business support services to help SMEs.



Transcoast strengthened the economic vitality of coastal regions by supporting the planning, design and implementation of measures to transform sub-standard port facilities into new functions, including marinas and amenities for maritime leisure and tourism activities.

Three projects in the cluster were delivered through other INTERREG Programmes:



Living with a Changing Coast (LiCCo) helped coastal communities to better understand and prepare for the impacts of climate change by working with the local community to examine historical records that show changes in the coastline and promote understanding of coastal change as a long-term trend. Part of the INTERREG IVA Channel Programme.



Network Of Straits (NOSTRA) studied the necessary governance tools to ensure that straits across Europe are sustainably developed, and to develop their functions as gateways to hinterlands and external territories. Related to this work is Grand Site de France des Deux Caps, awarded “Grand Site de France” in March 2011, where integrated management and governance is required to ensure balanced development and the preservation of this unique area. Part of the INTERREG IVC Programme.



Green Infrastructure for Tomorrow – Together! (GIFT-T!) invested in job creation, protecting habitats and boosting rural economies. The project focused on attracting funding for Green Infrastructure, implementing “green” Business Plans and engaging the community in positive planning. Part of the INTERREG IVB North West Europe Programme.

Sharing the learning and expertise

Over the course of the cluster's activity, a diverse range of actions and approaches were undertaken including project reviews, tools and techniques exchanges, data sharing, regional and cross border meetings alongside informal networking.

PRiME-C partners identified three themes related to ICZM which underpinned their understanding of best practice in coastal risk management: Environmental Change, Adaptive Planning and Participative Engagement.

Environmental Change

includes risks and impacts from changes in the natural environment. These include: climate change, flood risk, extreme weather, invasive species, marine pollution, eutrophication, dehydration, river health, availability of clean water and degradation of landscapes. Risks posed by environmental change must be identified and assessed before sustainable development and management can be implemented. Know your risks and opportunities.



Cliffs at Hunstanton
© Christine Wissink

Adaptive Planning is the concept that known risks can be minimised through sustainable planning. Potential issues may be caused by a number of factors including conflicts between users, unsustainable tourism, intensive land use, a lack of awareness of conservation issues, lack of communication between public bodies, changing availability of land and low community resilience. By understanding the implications of risks and management options, "no regret" decisions can be more readily taken. Be ahead of change.



Deux Caps Exhibition
© Eric Desaunios-CG62

Participatory Engagement

is the idea that when stakeholders participate in the risk management and planning processes, they take local ownership by helping to identify locally relevant problems and implement solutions. Stakeholders have local expertise that can improve the quality of identifying and planning coastal risk management. By working within the risk management programme, stakeholders increase the likelihood of its success. Build local ownership.



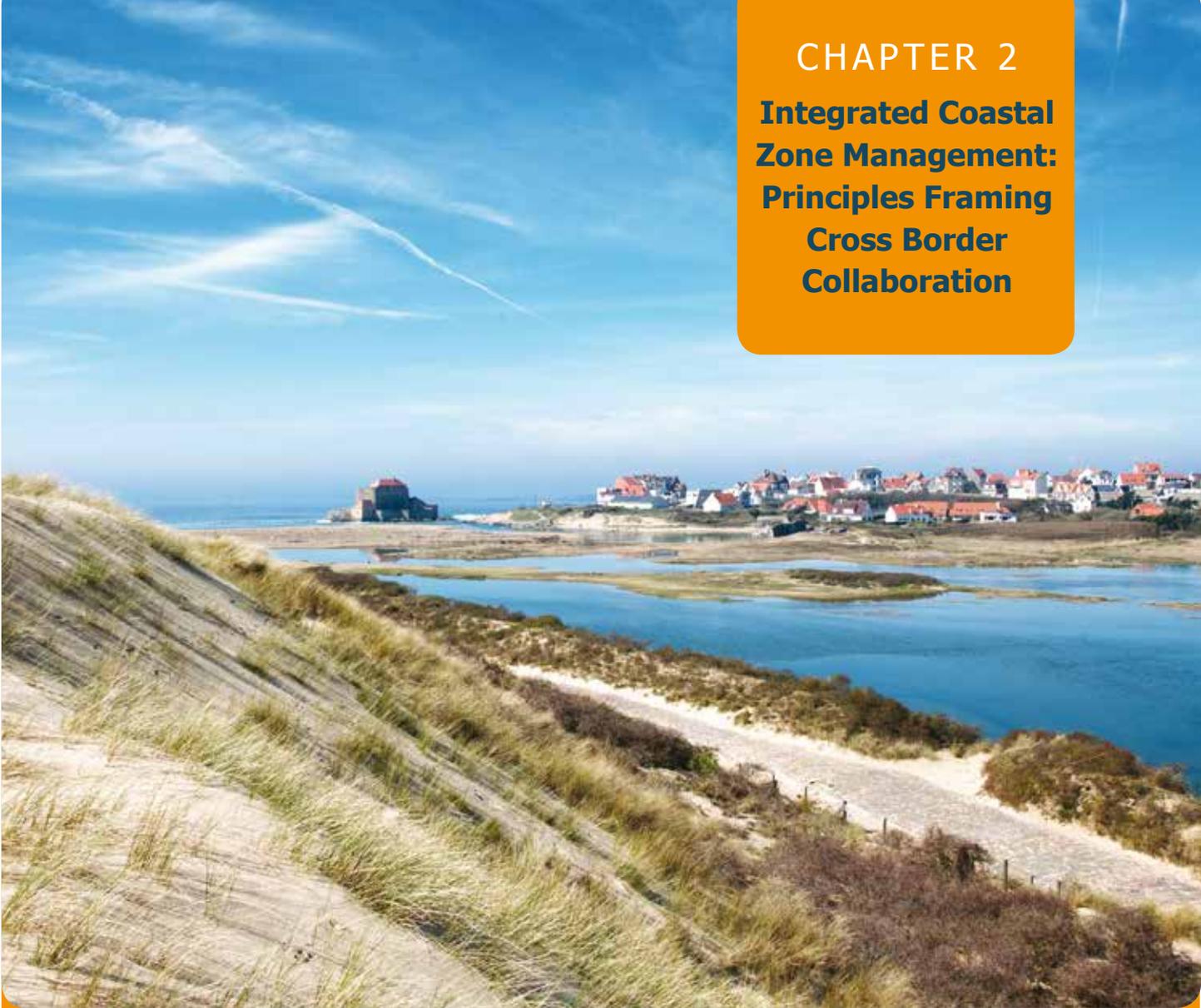
Community Workshop ©
Christine Wissink

Across these three themes, PRiME-C partners undertook internal reviews of the results and outputs of the nine projects, assessing them for cross border replicability and transferability. The process included reviewing activities

such as developing local plans, dissemination of base-line information, undertaking academic reviews, studying risk/opportunities and hosting pilot events.

The cluster achieved its primary ambition to identify and disseminate current best practice in risk management and engagement across the 2 Seas area through:

- Establishing a shared understanding of best practices and lessons learned in risk management and stakeholder engagement from 9 INTERREG projects.
- Exchanging valuable ICZM knowledge and expertise resulting in assessment, management and engagement tools and techniques.
- Using coastal networks to increase understanding of risks and opportunities resulting in the production of integrated action plans/priorities.
- Testing and trialling tools across organisations and sectors.



Baie de Slack, France. © Eric Desaunois-CG62

What is coastal risk and why should it be managed?

Integrated Coastal Zone Management (ICZM) offers a joined-up and participative approach towards planning and management of coastal areas incorporating human and natural factors.

Risk is the potential for consequences where something of human or natural value is at stake and where the outcome is uncertain. Change is a primary source of risk. **PRiME-C partners recognise that change is a constant factor in the lives of coastal communities.** Vulnerability is the likelihood of someone or something being adversely affected by risk. Vulnerability can also be seen

as the capacity of a community or ecosystem to respond to potential change.

In the European Union, coastal zones are among the areas most vulnerable to climate change and natural hazards. Risks include: flooding, erosion, sea level rise, salinization of water supplies, extreme weather events, and entry points for invasive species.

PRiME-C partners found the effects of these changes can be far-reaching and are already altering not only the lives and livelihoods of people, but the balance of ecosystems in coastal communities. . Due to a wide range of socio-economic, political and environmental factors, coastal risks increase pressure on bionetworks, community infrastructure and economic as-

sets. For example, predicted rise in sea levels will increase the risk of flooding and erosion in many areas which are popular settlements, tourist destinations, business zones and transit points. Similarly, dense population concentrations and high utilisation of natural resources can lead to biodiversity loss, habitat destruction, pollution, conflicts between potential users and congestion problems.

On the other hand, with risk comes opportunity. Coastal zones are among the most productive areas in the world, offering a wide variety of valuable habitats and ecosystem services that have always attracted people. Human populations have taken advantage of the beauty and rich natural reserves of the 2 Seas area for thousands of years. During this time, there have been large-scale landscape changes which have impacted the availability of land and resources. **PRiME-C partners believe the wellbeing of populations and economic viability of many businesses depends on the high quality natural environment of coastal zones in the 2 Seas area.** Changing the approach to coastal risk management is therefore essential, as the decisions made now will directly influence the way future risk is addressed.

Risks will need to be managed to make the most of any future opportunities that environmental change might provide. Communities will need to adjust the way they think and act. Developers will need to build based not just on today, but what the future might bring. Planners will need to provide people and the environment with space and capacity to adapt to change. **PRiME-C partners consider that a participative and holistic approach is fundamental to balance these sometimes con-**



Broadstairs, England. ©Dean Williams

licting requirements. Across the 2 Seas area, risk management includes: adapting to changing environments and economies, holistic management of the land/sea interface and integrated conservation of productive marine zones.

What is integrated coastal zone management?

Integrated Coastal Zone Management (ICZM) can be defined as "...a dynamic process for the sustainable management and use of coastal zones, taking into account at the same time the fragility of coastal ecosystems and landscapes, the diversity of activities and uses, their interactions, the maritime orientation of certain activities and uses and their impact on both the marine and land parts" (IUNEP). It promotes the adoption of a joined-up and participative approach towards planning and management of coastal areas, incorporating human and natural factors across land and marine environments. The importance of ICZM is recognised across the world through the Protocol to the Barcelona Convention on Integrated Coastal Zone Management, which was ratified by the EU in

2010. ICZM is supported by the EC publication Integrated Coastal Zone Management (ICZM) Strategy for Europe of 2002 in which eight principles of ICZM were adopted, providing the focus for future strategy development and delivery.

ICZM provided the PRiME-C cluster with a suitable framework to develop and share expertise and approaches to coastal risk management and stakeholder engagement. Through the lens of the eight ICZM principles, PRiME-C partners networked their experience and knowledge across the nine projects to draw together evidence, techniques, challenges and opportunities of benefit to coastal managers across the 2 Seas area. This was particularly apt because future coastal decision-making and policies in all Member States will be grounded in the context of ICZM. The on-going importance of protecting, valuing and developing coastal areas sustainably is clearly incorporated in the priorities of future 2014-2020 EU INTERREG programmes.

How were ICZM principles applied through PRiME-C?

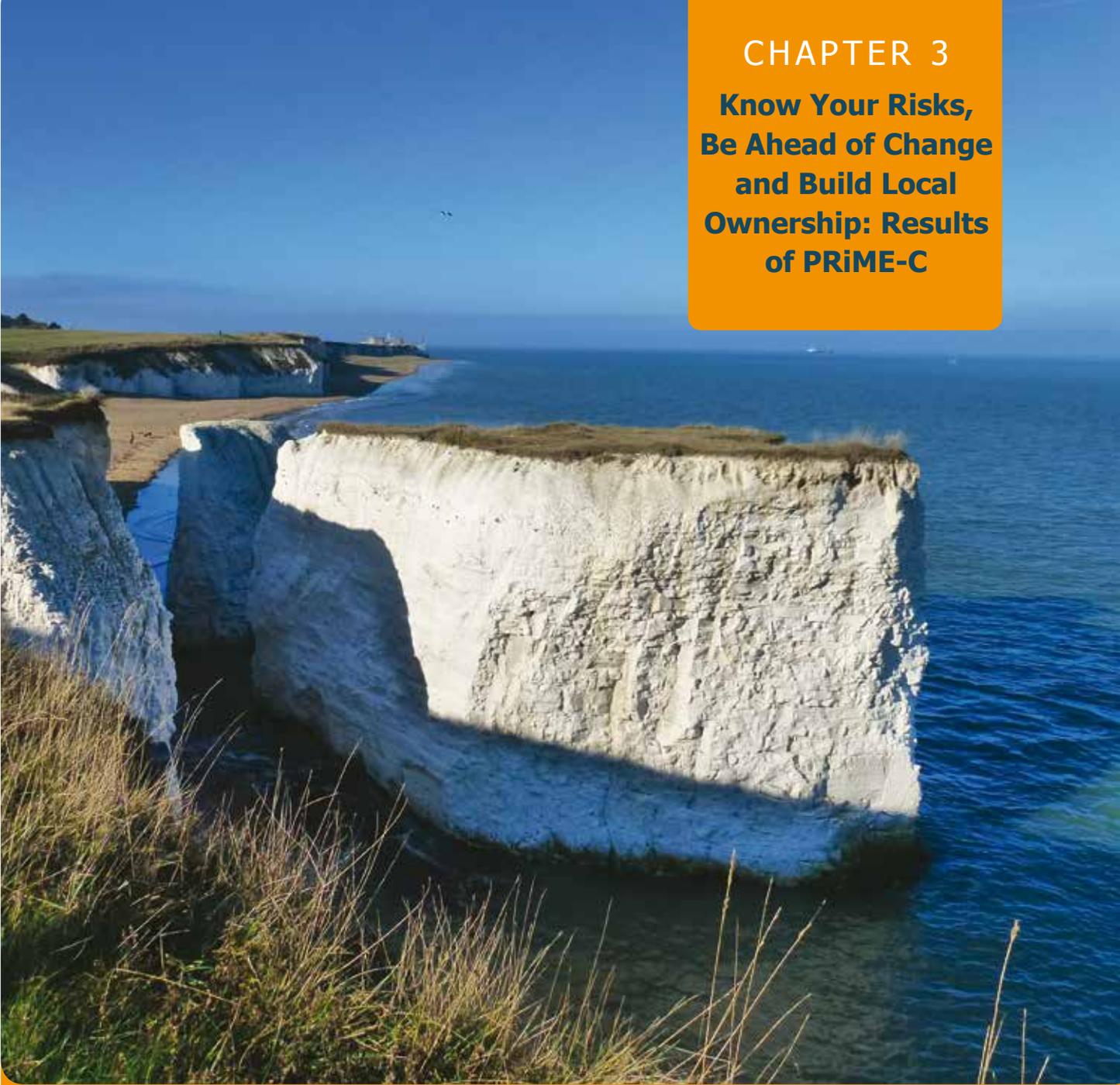
In establishing a risk management programme, it is essential to make use of long term and inclusive approaches such as ICZM. This approach can enhance the protection of coastal resources while increasing the efficiency of their use. PRiME-C demonstrated how the eight ICZM principles can be applied to consider and address risk. PRiME-C partners used these principles to look at natural and human activities, consider how future needs could be met and investigate new insights and developments for adaptation. They also agreed that engagement and communication is vital for stakeholders to understand how their property, assets and community may be affected over time. **PRiME-C recognised that successful risk management programmes were founded on these principles.**

The table summarises how coastal risk management was integrated into development and management planning policies affecting the coast.

The Principles of ICZM	How this has been applied in PRiME-C
A broad "holistic" perspective	Integrated the expertise of nine organisations covering a range of different disciplines and sectors. Used best practice from a range of thematic projects. Worked with partners from 4 countries.
Participatory planning	Involved stakeholders in developing plans by encouraging the sharing of local expertise and providing user-friendly interactive platforms to understand the risks.
Support & involvement of all relevant administrative bodies	Included the "triple helix" of public bodies, academic institutions and businesses. Networks included a range of administrative bodies across the Member States.
A long term perspective	Considered historic evidence (from over 8,000 years ago) while also envisaging the future up to 2150.
Adaptive management during a gradual process	Addressed risk from a perspective of what is likely to happen in the future, over time. Encouraged reflection and evidence gathering before action.
Reflect local specificity	Took community evidence into consideration. Understood that tools and techniques would need some degree of localised changes when analysing for transferability.
Work with natural processes	Placed emphasis on the natural environment and recognised both its value and its vulnerability to change or misuse.
Use of a combination of instruments	Used meetings, websites, maps, frameworks, apps, strategies, historic images, economic drivers, school resources, training to establish best practices.



Beach Huts in Old Hunstanton, England ©Christine Wissink



Erosion at Botany Bay, England. ©Explore Kent

Coastal risks can be managed effectively and efficiently through a variety of cross border processes, methodologies, and techniques.

In their assessment of the nine projects, **PRiME-C partners found that successful risk management takes time, resources and the integration of multiple dimensions.**

Using the ICZM principles to underpin their work, partners identified three aspects to consider when designing future cross bor-

der coastal risk management programmes throughout the 2 Seas area:

1) Environmental Change—know your risks and opportunities by identifying and assessing potential threats and vulnerabilities across a range of sectors;

2) Adaptive Planning—be ahead of change by develop-

ing interdisciplinary strategies to minimise negative impacts and increase resilience; and

3) Participative Engagement—build local ownership by actively including stakeholders in the management processes. This section identifies lessons and best practice from PRiME-C cluster activity corresponding to these themes.

Environmental Change: Know the Risks and Opportunities

PRiME-C partners used their expertise to identify a variety of cross-discipline risks to the natural environment common to all Member States. These included: non-native invasive species, marine pollution, eutrophication, climate change and degradation of landscapes. These risks may be caused or exacerbated by a number of factors including: conflict between users, unsustainable tourism (especially at peak times), intensive agricultural land use, lack of awareness of conservation issues, poor planning and excessive development. They are also likely to impact coastal areas more acutely than inland areas due to distinctive physical and demographic profiles of coastal areas. Through their assessments, PRiME-C partners identified three primary threats: climate change, diminishing green spaces and declining biodiversity.

The risks posed by climate change, a phenomenon brought on by fluctuations in the earth's atmosphere and weather patterns, are directly and indirectly impacting on coastal regions. PRiME-C partners determined effects on the 2 Seas area included water

scarcity, excessive heat, flooding due to sea level rise, faster coastal erosion, changing habitats and more extreme weather events. These effects are impacting the livelihoods of coastal communities through storm damage, as seen over the winter of 2013/14. They are also disturbing the delicate balance of coastal ecosystems through the loss of intertidal salt marshes and increasing numbers of invasive species.

Diminishing green spaces due to the reshaping of coastlines and landscapes can have detrimental impact on ecosystems, cultural heritage and people's physical and mental health. The combined effect of losing land to the sea and increased development in coastal areas puts great stress on remaining green spaces and local flora and fauna. As a result, declining biodiversity has serious implications for conservation, agriculture, historic sites and wellbeing in coastal regions. PRiME-C partners recognised threats to green space and biodiversity are primarily caused by physical changes to the environment and human interaction with the landscape.

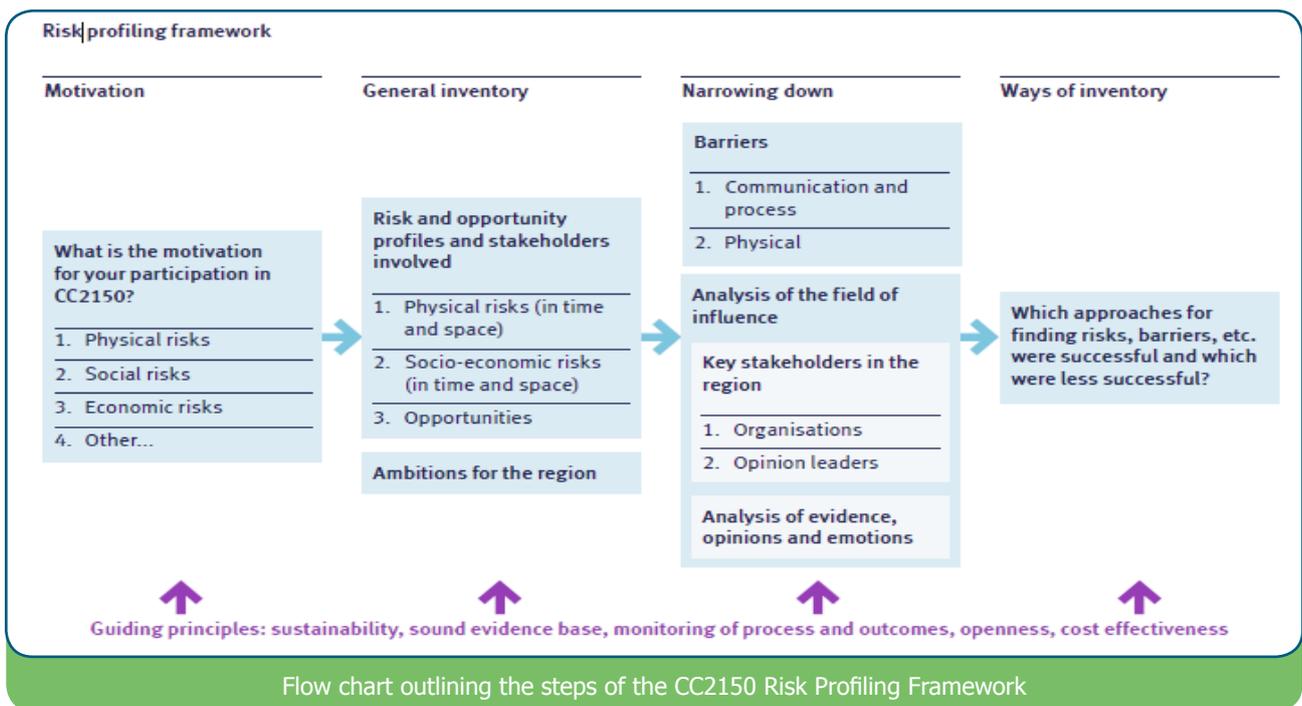
With holistic assessments of the types of risks posed to the 2 Seas area by environmental change, PRiME-C has highlighted a range of cross border frameworks, methods, and tools that could be used by coastal managers in all Member States to help them identify their risks and opportunities.



Storm Surge in Pas-de-Calais, France © Eric Desauois-CG62

LESSON: ASSESS AND PROFILE RISK USING A MULTI-DIMENSIONAL APPROACH

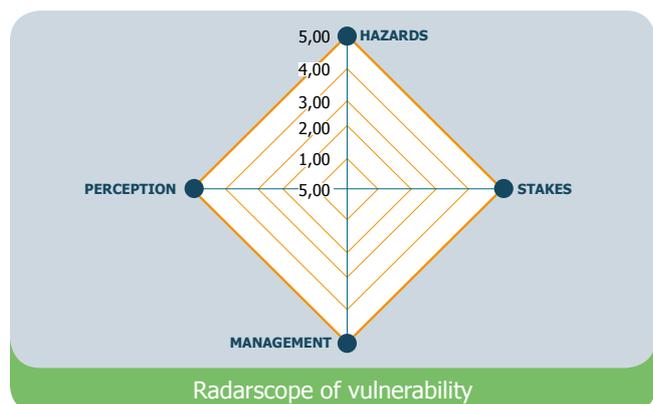
PRiME-C partners established that a multi-dimensional approach (using several indicators to measure, monitor and evaluate risks posed by environmental change) was most effective for cross-sector risk assessment and profiling. By taking this approach, numerous risks can be assessed at once, as well as incorporating any secondary or knock-on effects. A multi-dimensional approach is particularly useful when attempting to assess complex layers of risk such as climate change's physical, social and economic implications. It is also valuable because it can be applied to specific spatial areas which have multiple and interacting uses and impacts. For example, the green space of a coastal park serves as both a space to promote biodiversity while also increasing people's wellbeing.



Best practice framework for risk profiling and model for risk vulnerability assessment

The CC2150 risk profiling framework was specifically designed for climate change, but can be applied to any complex risk. The main principle of the framework is to establish a sound evidence base by gathering a range of cross-sector data on potential risks, then comparatively analysing it to create a profile, and finally, identifying potential management approaches. It is a straightforward and sequential framework that offers deep exploration of risks through encouraging the identification of opportunities, use of interdisciplinary data and pre-mediation assessment of barriers. Cross-sector transferability was demonstrated by the use of a similar framework in the RINSE project to identify the threat of non-native invasive species.

Likewise, a team of cross-discipline researchers designed the VULTEC research project which focused on evaluating the vulnerability of coastal territories to the physical risks of erosion and maritime pollution. Researchers created an analysis grid used to assess vulnerability in 4 dimensions: hazards, stakes, perception, and management. Each dimension is analysed and evaluated on a separate grid, facilitating the development of vulnerability indicators. This process was designed in collaboration with risk managers and local authorities to become a decision support tool across Member States.



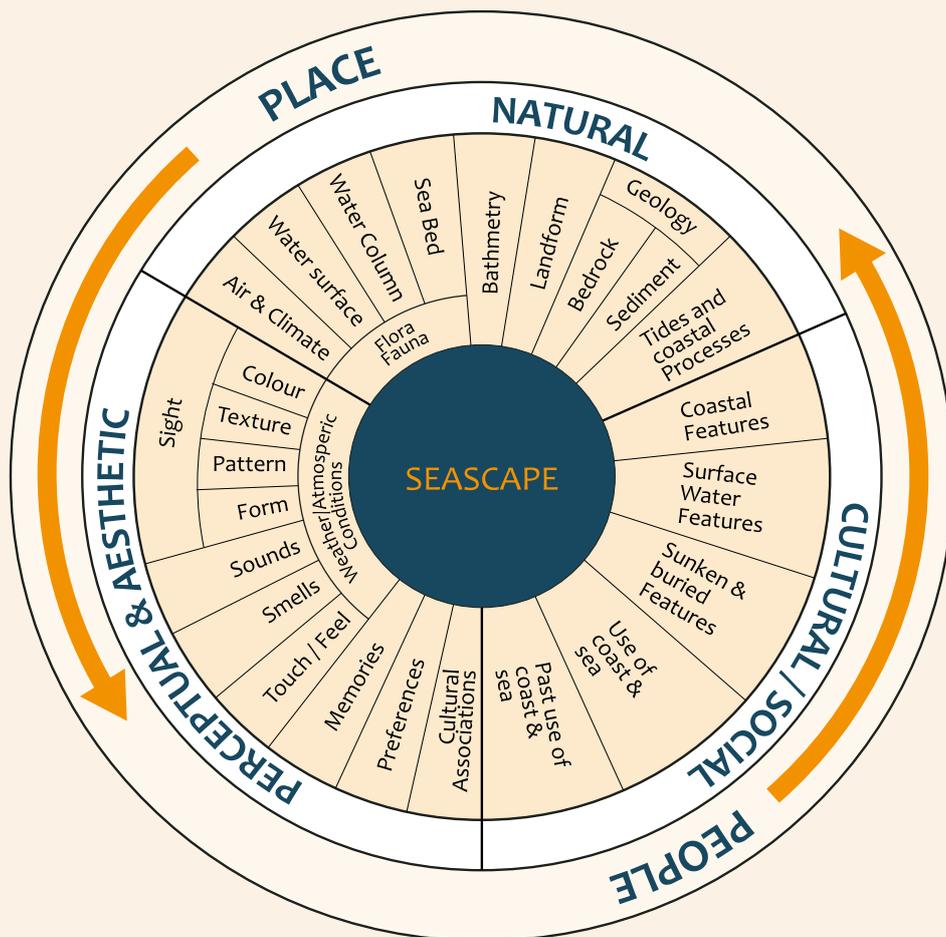
LESSON: UNDERSTAND THE VALUE OF SEASCAPES

Coastal communities across the 2 Seas area inhabit landscapes that share similar geological and anthropological histories, yet look and feel entirely different today. This difference is primarily due to a variety of modern social and cultural influences in each Member State. PRiME-C partners acknowledged a need to understand the value of coastal landscapes including how people interact with the natural environment and the human/natural implications of future environmental change. The use of seascapes (coastal landscapes including land and sea) and ecosystem services are key to establishing baselines and evidencing sound coastal risk management decisions in the face of diminishing green spaces and declining biodiversity.

Best practice technique for assessing the characteristics of a marine area

The NOSTRA Project piloted a Seascape Character Assessment (SCA) in the Dover Strait. An SCA follows the well-established processes of a Landscape Character Assessment, recognised by the European Landscape Convention, to identify the natural, cultural and aesthetic characteristics of an area through desk-top research, GIS analysis and field surveys. The result of an SCA is an invaluable evidence base specifying the strong cultural identity and natural features of an

area. This can be used to encourage better informed decision-making and policy development in coastal regions. The pilot in Dover Strait demonstrated how an assessment of the marine, intertidal and coastal zones can contribute to sound marine planning and management. The SCA was a fundamental element in the cross border production of the draft Dover Strait Implementation Plan by Kent County Council and Département du Pas-de-Calais.



The Seascape Wheel showing how different aspects of people and places interact in a seascape. © Natural England

LESSON: USE CULTURAL HERITAGE DATA TO EVALUATE AND MONITOR CHANGE AND RISK

Gradual change is difficult to perceive, whether it is an increase in annual ocean temperature, a shift from agricultural land to housing or a reduction in the number of native birds. As such, PRiME-C partners realised archaeological records, artistic depictions, historic maps, charts and photographs together with historic indicators, such as harvest dates and sea level measurements, were valuable resources for understanding past, present and future impacts of change on coastal areas. This type of data can be found with some degree of completion in all Member States, but access to these records needs to be improved. Using historic data to monitor change is not an exact science. In order to use cultural heritage data effectively, standardised approaches used across the 2 Seas area are needed.

Best practice approaches and methodologies for using historic records to understand coastal change

Many PRiME-C projects used historic data in their risk assessment or management programmes. The Arch-Manche project clearly demonstrated how archaeology, art and maritime coastal heritage can be used to show long-term patterns of coastal and climate change. Partners used data ranging from 8,000 year old archaeological sites (now under 11 metres of water) to classic 18th century landscape paintings to provide high resolution evolution models of coastal change spanning thousands of years. LiCCo and Nostra found that historical photos proved invaluable in demonstrating ongoing changes in the use of coastal landscapes, particularly the amount of green space. CC2150 relied on historic sea-level measurements and past coastlines to project possible impacts of climate change 150 years into the future.

In addition, the Arch-Manche project partners found that, from the late Middle Ages onwards, historic maps, charts and artworks were completed with increasing detail and quality, although they were still of variable reliability and accuracy. Partners developed a cross border methodology for assessing the quality of these data for use in monitoring change such as coastal erosion, climate change, sea level rise and the amount of green space. For example, the methodology for maps evaluates topographic, geometric and chronometric accuracy. As a result, the more reliable maps can be used to create evolution models which demonstrate the scale and rate of change over time. Similar methodologies were used for the other resources including archaeology, art works, and photographs.



Engraving of Reculver Church on the north Kent coast from 1823 by W. Daniell (courtesy Prof. R. McInnes).
© R. McInnes



Diver investigating the submerged landscape at Bouldnor Cliff (image courtesy MAT) © MAT

LESSON: MONITOR CHANGE INDICATORS USING OBSERVATORIES

Observatories can be physical or digital, cross border or local, but they all share a common function as a monitoring hub for a range of risk and change indicators including sea level rise, coastal erosion, number of species and current research. PRiME-C partners found the establishment and participation in these hubs can benefit cross border co-operation by facilitating data sharing between partners and Member States. They also encourage holistic integration, as many observatories have experts from a wide range of sectors and disciplines.

Best practice examples of using observatories

The LiCCo project has monitored different aspects of the natural environment in coastal areas in order to assess how they are evolving in response to climate change. This includes a monitoring programme at Studland beach in Dorset, where data is collected annually on the movement of the strand line, dunes and cliffs to the south of the bay. This data is fed into the Channel Coast Observatory. Similarly, the Grand Site des Deux Caps runs a photographic observatory. Photographic data is gathered from various defined

viewpoints over time, enabling physical changes to be studied and monitored. Approximately 60 observation points have been defined across the Deux Caps territory. Also, the FUSION partner observatory provides a repository for material across the 2 Seas area on the "circular economy." Observatory experts meet virtually on a blog website, and from which they are able to conduct research, run surveys and respond quickly to advancements in this rapidly evolving field.

LESSON: USE FIELDWORK TO TEST RISK MANAGEMENT AND MONITORING METHODS

Before fully implementing a risk management programme, PRiME-C partners found that management and monitoring methods should be tested in the field. This allows for evaluation of the likely cost-effectiveness of the programme, identification of any incidental effects of the management techniques and establishment of procedures to overcome any unforeseen barriers.

Best practice in non-native invasive species and archaeological field work

Three RINSE partners have been working on better ways to manage populations of non-native geese which cause damage to agriculture through over-enrichment of waterways, trampling of crops and over-grazing. Flemish partners within the RINSE project have carried out trials of novel techniques to capture Egyptian geese. The geese are caught using a new design of cage trap, before being humanely dispatched. These trials have helped develop more effective approaches to control numbers of Egyptian geese. Canada geese are also a problem in the 2 Seas area, and have been captured in Flanders for a number of years to help reduce their numbers and impacts. Through RINSE, moult captures of Canada geese have been carried out as a demonstration project, giving stakeholders from the UK and northern France an opportunity to learn the effective techniques developed in Flanders and use this new knowledge in their own area.

Similarly, the Arch-Manche project partners undertook archaeological fieldwork in order to obtain information on coastal change. This detailed investigation included underwater survey and sampling of the submerged prehistoric landscape of Bouldnor Cliff in the

UK. This Mesolithic site of human occupation is now 11 metres below the surface and some 250 metres offshore. It is constantly being eroded by local tides which both damages and exposes historic material. A sequence of drowned prehistoric landscapes have provided detail of sea level rise, periods of stable sea levels and through monitoring programmes micro-scale understanding of modern day seabed erosion. Scientific dating and environmental analysis of this material has provided high resolution evidence for the changing landscape at the site over the last 8,000 years.



A goose captured in one of the new cage traps, developed through the RINSE project © RINSE

Adaptive Planning: Be ahead of change

A fundamental concept in risk management through ICZM is encouraging cross-sector, sustainable coastal development and spatial planning. After threats and vulnerabilities are identified, profiled, assessed and monitored, risk management programmes should suggest how to minimise their impacts on coastal communities and landscapes while facilitating future opportunities. **PRiME-C partners believe the primary goal for managers and policy makers is to make “win-win” or “no regret” decisions when implementing a coastal risk management programme.**

Popularity of coastal regions and increasing levels of development across the 2 Seas area is resulting in higher competition for limited space and resources. These pressures can lead to multiple, often conflicting, demands and vulnerabilities such as damage to property from severe weather, water scarcity caused by overuse and drought, conflicts of interest between user groups, and unsustainable management of tourism.

On the other hand, in some coastal communities, socio-economic conditions are becoming increasingly precarious as tourism and industry have declined. Many of the remaining jobs in these sectors are relatively low-skilled and low paid. The overall demographic structure has been affected by young people tending to move away from coastal areas to find work, only to be replaced by retirees or second home owners.

PRiME-C partners determined that knowing the risks and identifying opportunities enabled better decision-making on how the limited space in coastal areas could be planned and managed. Adaptive planning across sectors, borders and disciplines makes it possible to take account of future risks and facilitate “no regret” planning decisions. The PRiME-C cluster identified and analysed a variety of ways to implement adaptive planning at a local and regional level, through landscape planning, spatial analysis and green infrastructure.

LESSON: USE MARINE SPATIAL PLANNING TO ADAPT TO RISKS

Marine spatial planning can help coastal managers adapt to risks and deliver sustainable development by examining and assigning the spatial and temporal distribution of human activities in coastal areas. The aim is to evaluate and balance social, economic and ecological demands on coastal resources. The marine spatial planning process follows principles mirroring those in ICZM, resulting in a clear direction for future coastal development. PRiME-C partners demonstrated that marine spatial planning supports the holistic integration of different sectors and stakeholders while adapting to change in a single spatial plan. They also found the ability to scale the process up or down is vital for transferability across the 2 Seas area.

Best practice methodology to deliver marine spatial planning

One of the main outputs of the C-SCoPE project was the development of a Coastal and Marine Spatial Plan and long-term vision for the Bay of Heist in Flanders. This plan and vision was developed using a cross border method. The first step in the methodology is to build an evidence base through collecting data, establishing baseline inventories, conducting socio-economic studies and evaluating spatial interactions. Once the evidence base has been compiled, a task and finish group with key stakeholders is established to develop the plan and vision. The key stakeholders should be drawn from existing networks with strong relationships and should represent a diverse range of user groups and expertise. The task and finish groups become the delivery mechanism, using meetings, workshops and interviews to draft concept visions and plans. While this methodology is resource inten-

sive and time consuming, the results are robust and holistic. This method can be used for the sustainable development of coastal areas across the 2 Seas area.



Koksijde, Belgium. ©Christine Wissink

LESSON: INTEGRATE CROSS-SECTOR DATA USING INTERACTIVE MAPS

Collecting, distributing and integrating a wide variety of high quality cross-sector data in a useful way is essential for adaptive planning. PRiME-C partners determined using online interactive data “layering” systems to compare and contrast spatial datasets from different sectors was helpful in the planning process. Online interactive maps are effective platforms to provide this resource as they offer easy access to the wide range of information integral to holistic planning. They also provide users with the ability to turn data layers on and off depending on the comparison or analysis being conducted. For example, the resource could be used to highlight those parts of a coastal zone that host protected ecosystems and are also at risk of coastal flooding. Across Member States, there are a number of topic-specific online interactive resources currently available. In future, integration of these and other systems would be useful for cross border risk management and planning by making all data sets available into one common user-interface with full geographic coverage of the 2 Seas area.

Best practice in using cross-sector interactive maps

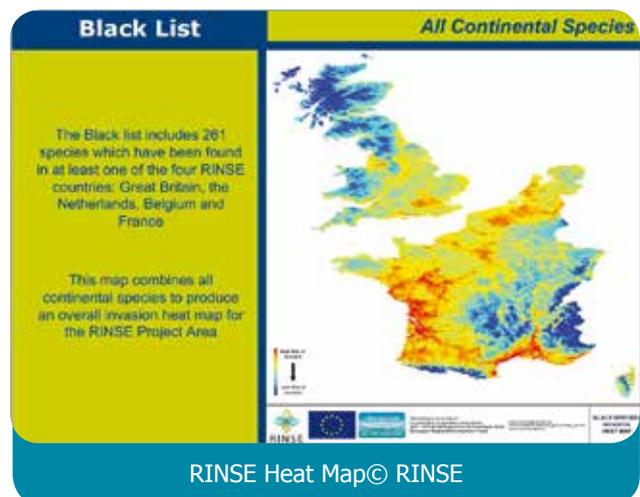
COASTAL ATLAS: The C-SCoPE project expanded and upgraded the Coastal Atlas for West Flanders in Belgium into an interactive and dynamic planning tool including coast-specific sustainability indicators to inform decision-making for the area. Seventy coastal stakeholders carefully selected 24 indicators during several workshops. Each indicator measures a typical coastal aspect and is linked to a priority, chosen to assess the current state of affairs. They also illustrate observable trends in the coastal region. The online Coastal Atlas has supported the sustainable development of the Belgian coast.

INTEGRATING HISTORIC DATA: The Arch-Manche project developed a database of archaeological and palaeo-environmental data, historic paintings, maps, charts and photographs, with rankings based on reliability and potential to provide information on coastal change. This database can be viewed and analysed spatially through an online portal. Arch-Manche partners have also contributed to the development of online 2D and 3D models which demonstrate the evolution of the coast in three case study areas across the UK, France and Belgium on the maps.

CLIMATE CHANGE IMPACTS: The CC2150 project in Kent used interactive data layers to overlay climate change data with development assets, flood risk and natural environment designation and habitats, so that users could compare the information when planning future adaptation measures. These maps contributed to stakeholder understanding of how planning is constrained by risk and how adaptive thinking is required to solve social, economic and environmental issues in coastal areas.

HEAT MAPS: The RINSE project used computer models to create “heat maps” indicating the areas where the most damaging invasive non-native species

(INS) were likely to occur. By overlaying these maps on top of each other, RINSE partners created a map indicating the likely location of “invasion hotspots”. This information could be used by policy makers to help focus measures to prevent establishment of INS on the most vulnerable areas.



LESSON: USE SOCIO-ECONOMIC CHANGE TO ENHANCE COASTAL AREAS

Risk and change affect coastal communities differently depending on whether an area is experiencing socio-economic growth, stagnation or decline. PRiME-C partners recognised future opportunities can be maximised by making these changes a catalyst for using coastal resources in new and sustainable ways. Some coastal communities in the 2 Seas area have faced economic decline as factories and ports have shut down. These built-up areas, distinguished for their architecture and amenity potential, can be redeveloped to encourage “win-win” or “no regret” regeneration by accounting for future economic and environmental changes.

Best practice in understanding climate change opportunities, the economic effects of regeneration and managing increasing visitor numbers

Through PRiME-C, a study was conducted to identify the business opportunities arising from climate change. Initial results suggest promoting opportunities helps “sell” climate change awareness and adaptation to smaller businesses, who may be sceptical of it in principle and focused on short term business impacts. The main opportunities from climate change and adaptation include:

Market opportunities: increased market for efficient and resilient products, new products and services; more visitors with warmer, drier, summer weather.

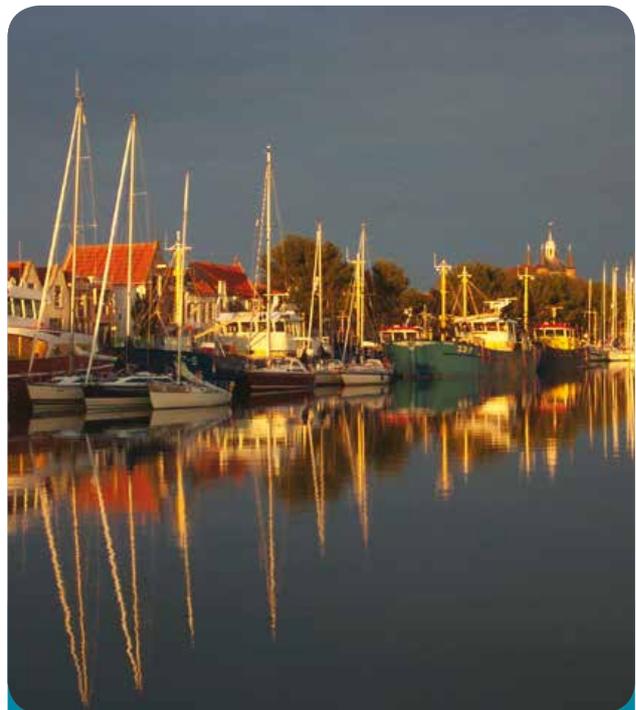
Cost saving opportunities: lower fuel bills through energy efficiency and a warming climate; lower insurance costs if the business adapts to be resilient; and fewer disruptions in some sectors.

Competitive advantage: cost or “brand” advantage through reputation for adapting; minimised disruption from severe weather events.

Similarly, the TRANSCOAST project determined change and proactive organisation could bring economic benefits to coastal areas. Partners worked with the old city of Zierikzee, in Zeeland, where the potential for strengthening economic vitality through transforming old ports into new maritime leisure and tourism facilities was recognised. The goal was to balance environmental needs with the opportunities presented by tourism, leisure and recreation uses. A web-based model was developed to determine which types of investments in port regeneration (such as improvements to capacity, quality and environmental conditions) were economically most effective. The model works by inputting data on the size of the marina, possible expansions, level of investment and fees. It then calculates the annual impact of investment options on spending and employment opportunities. The model is non-area specific making it transferable to ports, harbours and marinas across the 2 Seas area. Using the model, two master plans for the port

area of Zierikzee were created to support the city’s regeneration efforts.

With recent inclusion into the Grand Site de France network, “Site des Deux Caps” in Pas-de-Calais is at increasing risk due to high visitor numbers. Département du Pas-de-Calais has developed a management plan that is helping them better understand the profile of visitors to the site, manage conflicts between different users and continue to protect native flora and fauna, while also responding to visitors’ expectations. The plan includes infrastructure improvements such as a new visitor centre, car parking, and new walking and cycling routes, which will encourage visitors into certain areas and thereby relieve pressure on others. This plan has useful suggestions for other areas experiencing unsustainable visitor numbers across the 2 Seas area.



Zierikzee, The Netherlands ©
Geemete Schouwen-Duiveland

LESSON: USE VISUAL MODELS AND TOOLS TO SPARK IMAGINATIONS

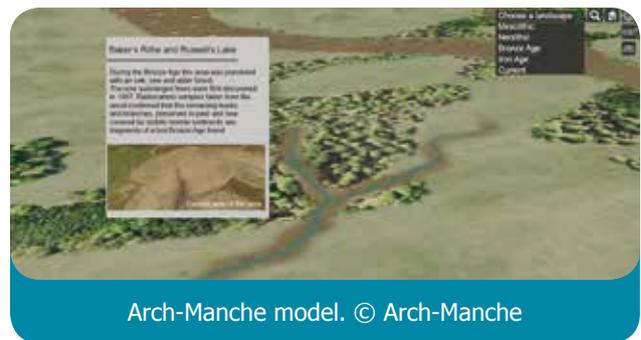
Visualisations use pictures or images to show how an area might look at some point in the future or how it looked in the past. PRiME-C partners found that visualisations work very well to show potential change in coastal areas, helping people to see beyond the present and better understand what change might look like in their area.

Best practice example in using artistic representations and 2D/3D models

Through the CC2150 project, two landscape architects were engaged to translate physical data, interview results and fieldwork into visualisations of how the town of Renesse might look in 2050. As a starting point, they used unique characteristics of the area, such as different landscape types and their typical landscape features. This led to a joint vision being developed by different stakeholder groups. In Kent, artists pictured the coast in 2150 to be more Mediterranean with palm trees and azure seas. This helped stakeholders imagine all the possibilities from change as well as acknowledge the risks. In the Lower Ouse Valley, sketches were used to bring management options to life. In the LiCCo project, partners created computer-generated images of locations around Poole Harbour, in order to better understand the potential local impacts of sea level rise. This material helped to stimulate discussions about how people can best adapt to future coastal change.

In addition, the CC2150, Arch-Manche and C-SCoPE projects produced computer generated visualisations of past and future change to help encourage engage-

ment. CC2150 used an interactive visualisation of the Lower Ouse valley to show how water levels in the estuary might increase with sea level rise (in 0.5 metre stages), where flood defences might be situated, and/or where land use might be changed to cope. Arch-Manche developed 2D, 3D and 4D computer animations and diagrammatic representations to illustrate change at individual sites over different time periods, to show how the landscape of the coastline has changed and evolved. C-SCoPE produced a “fly-through” animation of the sea-bed, so that members of the public attending community road-shows could understand more about the marine environment.



LESSON: USE GREEN SPACES AND CHANGE OF USE TO ENHANCE COASTAL AREAS

Green spaces, such as parks, woodlands and dunes, are well known to offer considerable benefits both to the environment and people. People benefit directly by making frequent use of green spaces for leisure, wellbeing, and recreation, but also indirectly through the contribution that green spaces make to floodwater regulation, air quality and human health. Green spaces also provide channels for migration and natural places for reproduction and existence of native flora and fauna. PRiME-C partners suggest that green spaces offer great potential for adaptive planning, as they improve habitat, increase resilience to climate change, provide local tourism amenities, and improve people’s health and happiness.

Best practice in shared visions using multifunctional landscapes

In CC2150, partners focused on the growing interest in recreation along the coast of Renesse. It was important to understand how tourism and leisure initiatives could be taken forward in a sustainable way and in line with other functions along the coast. This was achieved by translating risk information and future goals of different stakeholders into a shared vision, using inspiring photo manipulations of the characteristic landscapes around Renesse. The results promoted long-term coastal safety combined with economic

prosperity within an ecologically resilient environment. An online questionnaire revealed that stakeholders were enthusiastic about the positive common vision, but some concerns still exist: will the positive process continue, will there be money to realise the ideas, will all relevant parties be engaged. In PRiME-C, a green infrastructure tool was developed in a pilot study in which partners tried to translate the vision into physical preconditions for redesigning a dune stream area, in cooperation with stakeholders.

Participative engagement: Build Local Ownership

There is a growing consensus throughout Member States of the importance of actively involving stakeholders and local communities in achieving effective coastal risk management. The people who live, work and manage the land have much to contribute in the way of local knowledge: how their area is now and how it used to be. They may also have valuable historical information such as photos and paintings. They and other members of the public can work with professionals and scientists to add to the body of scientific knowledge about their locality. **PRiME-C partners recognised multi-disciplinary stakeholders and community members bring new perspectives and expertise to the risk management and planning process.** Engaging with these groups allows risks and possible adaptive actions to be investigated and challenged by different users, while increasing the reach and depth of resulting management programmes. Stakeholder

analysis helps to identify a range of people who can be actively involved from the early stages of developing risk management programmes. In addition, wider community outreach is crucial to explain and gain support for programmes as they develop.

By participating in the planning process, individuals and groups can help to shape their community's future and to prepare for changing conditions. **For PRiME-C partners, this resulted in these groups taking on new roles and responsibilities which built local ownership of the risk management process.** The complex and uncertain messages within coastal management present significant challenges for communication and engagement. However, PRiME-C partners found this can be overcome using a variety of methods such as workshops, interactive exhibitions and outreach programmes.



It is important to engage with all sectors of the community © Arch-Manche

LESSON: UNDERTAKE STAKEHOLDER AND BARRIER ANALYSIS

Stakeholder analysis is the starting point for participative engagement. It is used to establish a clear understanding of the people and organisations that have a stake in coastal risk management. Stakeholder analysis is a simple process of identifying individuals or groups and assessing their role in coastal risk management to determine their interest and how they should be involved. A comprehensive stakeholder analysis will show a very broad spectrum of groupings with varying levels of interest in risk management. In addition, it is useful to understand the barriers to engagement before beginning engagement or communication activities. With this information, coastal managers can proactively engage stakeholders, building their awareness and understanding of the risks facing coastal areas and encouraging their involvement in risk management programmes. Findings from PRiME-C provide useful illustrations of the benefits identifying key stakeholders and barriers.

Best practice in stakeholder and barrier analysis

STAKEHOLDER ANALYSIS: PRiME-C partners considered a range of stakeholders and their role in coastal risk management based on their experience during their projects. They also considered what an “ideal” integrated engagement process might look like. First, broad stakeholder groupings were determined. Then each group was assessed for how they used and contributed to risk management processes. The diagram (based on experiences) shows a diverse core of coastal residents, spatial planners and professional stakeholders collaborating with coastal managers. This demonstrates that future projects could do more to include a wider range

of stakeholders into their core influencing/decision making group.

BARRIER ANALYSIS: The University of Kent Psychology department produced two reports to inform the work of the CC2150 project by identifying existing barriers to and best practice in engagement on climate change. The first report highlighted barriers at a personal and community level, such as short-term thinking and perceptions of the community. It identified best practice that could mitigate the effects of these barriers, for example identifying short to medium term local and foreseeable risks, and presenting longer term scenarios in the most defi-

nite way possible. The report also suggested making engagement as public as possible to encourage others to become involved. The second report examined additional barriers, as well as looking at drivers of engagement such as environmental and community commitment. The conclusions of these reports can be applied to a wide range of complex topics.

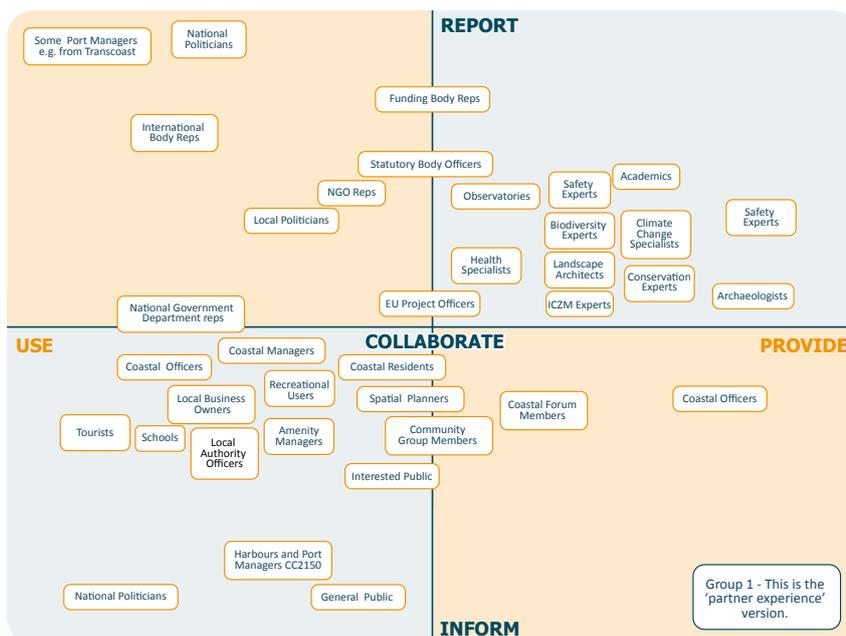
Local Challenges for Coastal Communities

- Remoteness (physical and cultural)
- Lack of access to information or political bodies
- Average levels of education participation and related illiteracy/innumeracy
- Migrant communities with different languages/cultures

Six principles of engagement to overcome barriers:

- Make the Future Now
- Frame the Issues Positively
- Encourage Self-Organisation
- Be a Partner
- Feedback Results
- Focus on Behaviour

Results from the CC2150 Psychology Report Phase 1



LESSON: INVOLVE TARGETED TECHNICAL PROFESSIONALS AND SPECIALISTS

Technical professionals have an important role to play by adding expertise in specific fields. There can be added value in combining the knowledge from very different fields of work, especially in atypical combinations. PRiME-C partners discovered it is important to involve people who understand the issues and can actively bring solutions to the table in the planning process. It is also important to bring in participants based on the skills and experience they can add for holistic consideration. PRiME-C demonstrated the value in broadening the scope of technical expertise when considering coastal risk management including perspectives from specialists such as: archaeologists, landscape architects, spatial planners, geologists, psychologists, artists, and entrepreneurs.

Best practice in involving specialists: “Atelier” and RINSE workshops

The “Atelier” workshop technique was developed within the CC2150 project and has been further developed through PRiME-C. The unique aspect of an “atelier” workshop is that it brings different technical experts together and uses facilitation techniques that push participants to solve problems creatively. During the first of three ateliers, the focus was on green infrastructure. Participants were asked how can coastal cities include green spaces in urban development and how can this green space help to reduce the impacts of climate change in the future. A mix of architects, landscape architects, spatial planners, and coastal-issues related experts were invited based on their particular experience, knowledge and skills. The approach proved to be a very powerful tool. The synergies between partners made it possible to “think out of the box” and look from multiple angles around one challenge.

RINSE ran a number of Best Practice Workshops focusing on different aspects of INS management, including catchment level strategies, the use of volunteers and citizen scientists and the control and eradication of invasive aquatic weeds. These workshops brought together experts from across the 2 Seas area, and further afield, to exchange ideas and proven approaches. The workshops were truly cross border in nature, leading to unprecedented levels of information exchange between stakeholders in the different areas represented in the RINSE partnership. In addition, through PRiME-C, a wider review was conducted to identify INS relevant to the coastal zone, together with the management measures relevant to their control. This suggested sectors which operate within coastal areas need to be included and involved in INS management as part of their daily activities.



The RINSE project involved technical experts and fieldwork © RINSE (INBO)

LESSON: BRING PEOPLE TOGETHER

While it is important to bring experts and specialists together, it is also important to invite stakeholders and community members to participate actively in the planning process. PRiME-C partners hosted thematic, facilitated, hands-on workshops as the best method of getting people in one room and encouraging them to actively contribute. Many PRiME-C workshops involved attendees using flip-charts, coloured pens, post-it notes, sticky dots and planning grids to share their views. The open and participative approach to these workshops helped to build trust with community members and stakeholders. They also resulted in outputs that genuinely contribute to the planning process, helping to establish local ownership.

Best practice technique: bringing people together in thematic workshops

LiCCo partners arranged a well-attended workshop for National Trust staff, "Walking the Talk: Adapting to Coastal Change". Attendees were able to learn about current coastal management, what could happen in the future and the difficulty of dealing with uncertainty. They then contributed their views on the opportunities and challenges coastal change could bring to their various National Trust properties.

Through CC2150, partners piloted an experimental ecological systems workshop. 30 people from different disciplines worked in small groups to examine links between natural systems, resources and human consumption in the Lower Ouse Valley through photographs and graphic elements. The results were presented on a large wall map of the area and then used to examine the impacts of long-term climate change. The workshop identified the need to produce a risk management adaptation plan that takes account of both long- and short-term impacts of climate change. A template and film on how to run the workshop in other communities has been produced.

The GIFT-T partners brought together an international audience of over 75 people midway through their

green infrastructure and ecosystem services project, in order to gather feedback on the project from a bigger, external audience. The perspectives offered were varied and included a large private sector business, a property management group, a forestry management group and a representative from DG Environment.



Bringing people together in thematic workshops © CC2150

LESSON: GO OUT TO COMMUNITIES

Wider community members are busy with their own lives and pursuits. Their work can keep them away from meetings held during the working day and personal interests can prevent them from attending evening meetings. They may not know that coastal risk management affects or interests them unless they are exposed to it through a negative event, such as a storm surge. Due to this, PRiME-C partners determined physically going out to the wider communities to engage them in the planning process maximised participation.

Best practice technique: visit community events and high foot-traffic areas

The Arch-Manche, CC2150, NOSTRA and LiCCo partners found that it was very effective to attend events that were already being organised by the community, such as village fetes, carnivals or shows. Partners attended a number of such events over 2013-14, and

engaged with over 3,000 people. Drop-in tables in high foot-traffic areas, such as supermarkets or council buildings, were also effective. These events provide exposure to new audiences at their leisure and at a very low cost.

LESSON: USE APPS AND SOCIAL MEDIA TO INCREASE ENGAGEMENT

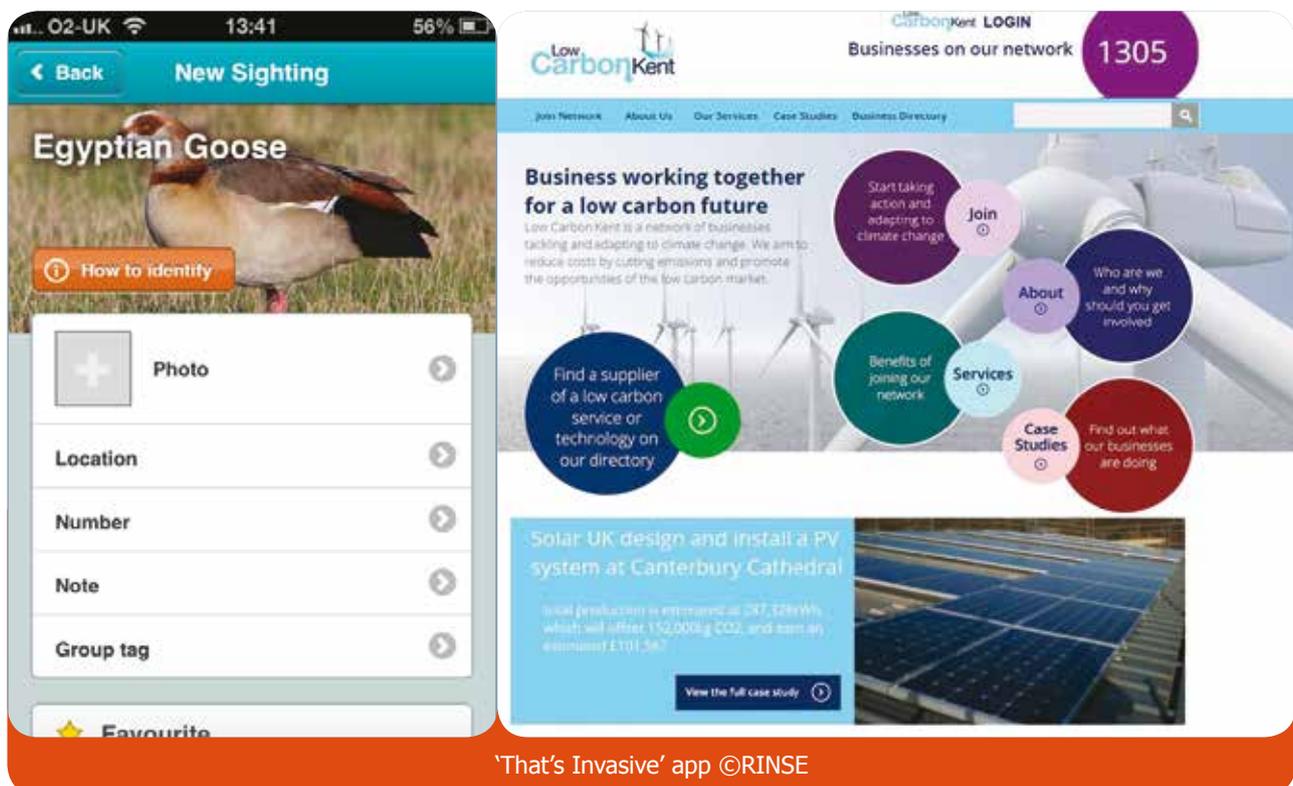
The opportunity to use IT-based approaches for practical purposes, integrating data and enabling more effective stakeholder involvement was recognised across the PRiME-C cluster. Apps and social media allows 24/7 access to stakeholders and innovative approaches to engagement, putting the risk management process in the hands or pockets of the stakeholder. Apps and social media are also easy to use, can be targeted at particular individuals and can create a defined group for internal networking. PRiME-C results suggest that apps and social media will have increasing impact on risk management and engagement processes in future.

Best practice app and social media network

THAT'S INVASIVE!: Working with the NatureLocator team at the University of Bristol, RINSE partners developed a new smartphone app to harness the capacity of the general public to be the "eyes and ears" in the hunt for invasive species. "That's Invasive!" is available in three languages, for both iPhone and Android. The app contains all the information required to confidently identify over 35 invasive non-native species, including an extensive library of photographs. Users can submit their own sightings using the smartphone's built-in GPS and camera. These records are then verified by an expert to ensure that the data generated by the app is of suitable quality. Over time, a detailed map of the distribution of invasive non-native species will be built up, providing scientists and policy makers with the accurate data they need to make strategic plans to manage INS, whether through the prevention of further spread or large-scale control and eradication programmes. A study into the use

of this technique concluded it would be applicable to other areas of ICZM risk management.

LOW CARBON KENT: FUSION supports a network of businesses who are working together to support a shift to a low-carbon economy. The network, "Low Carbon Kent", has attracted over 1,000 members. The benefits of membership are, amongst others, access to free sustainable business advice from Kent County Council, invitations to various events including the annual Green Business Conference and access to the Steps to Environmental Management (STEM) scheme. The network has also developed a LinkedIn group with over 300 members. This online group is used to share ideas between businesses, link companies and showcase best practices. A similar type of online resource would be useful in creating a holistic network of experience and case-studies in risk management issues across the 2 Seas area.



'That's Invasive' app ©RINSE

LESSON: ESTABLISH STAKEHOLDER GOVERNANCE AND OWNERSHIP

The best method of ensuring that stakeholders take on governance and ownership is by assigning them roles and responsibilities in the risk management and planning process. PRiME-C partners found that integrating stakeholders, community members and businesses into governance structures and giving them responsibilities, encouraged them to participate more fully in risk management.

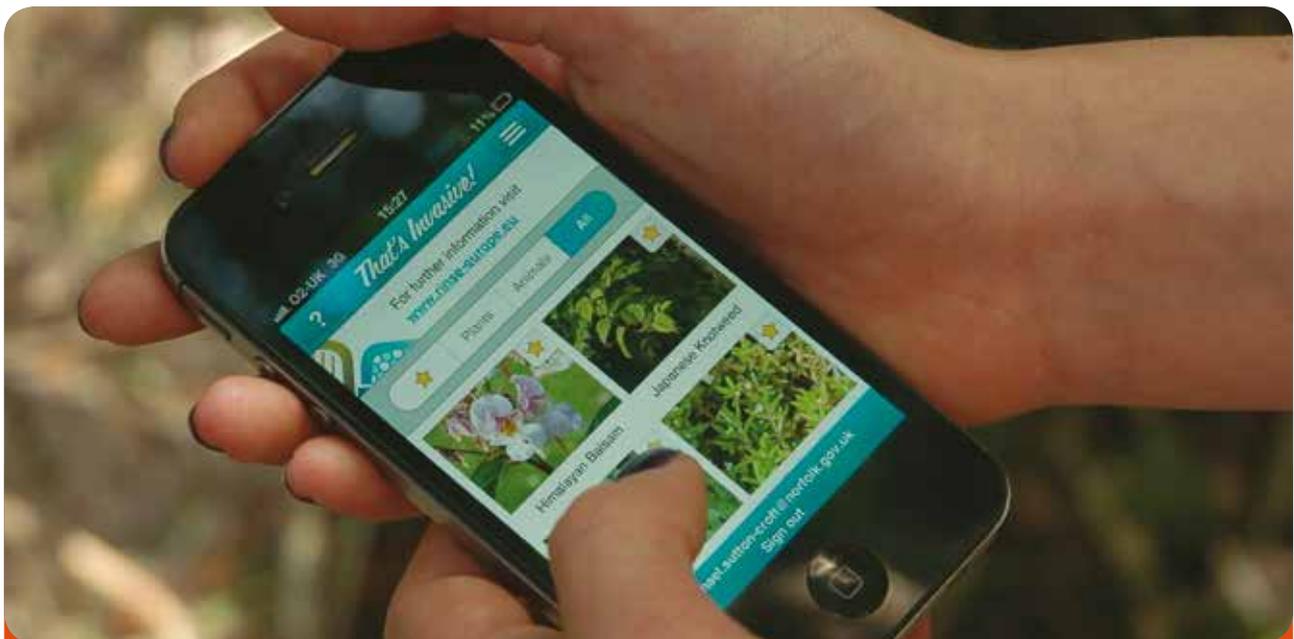
Best practice examples of involving stakeholders in governance and ownership

GOVERNANCE: Through the CC2150, partners developed a form of local governance known as Local Engagement Groups. Although set up in a variety of ways, they were all made up of local stakeholders who had an interest in coastal change. The Groups came together regularly to review emerging results from the project, and steered the community “Vision and Action Plan” to ensure that the results were based on local knowledge. Through the Deux-Caps project, partners held a workshop with local farmers in the Deux Caps to work out how to protect biodiversity and introduce more environmentally friendly farming techniques. Through this process, a strong working partnership was established. This led to the inclusion of farmers as a formal part of the site governance structure through the creation of a not-for-profit farmer’s organisation.

CITIZEN ROLES: Citizen science is expanding, enabling members of the public to play a part in scientific activity. RINSE has used citizen scientists through a new survey – “Urban Invaders”. This survey asks members of the public to report sightings of invasive non-native species commonly encountered in the ur-

ban environment. It combines traditional paper-based surveys with an online recording system developed by the Norfolk Biodiversity Information Service. The survey leaflets are distributed through libraries which are predominantly located in urban areas, ensuring engagement with a wide range of potential “citizen scientists.”

BUSINESS ROLES: The Fusion project worked with small and medium sized businesses (less than 250 employees) in coastal areas in Kent, and developed a way for businesses to understand how they might be contributing to risks facing their local coastal environments, or how they are having a positive impact. The Steps To Environmental Management (STEM) programme is a step-by-step guide to putting an environmental management system in place within a small or medium sized business. Fusion partners found that with this information, the businesses were better placed to integrate sustainable considerations into their business development, whether at a start-up phase or when growing their company. These results were supported through the PRiME-C SME study and can be applied to other coastal risks.



That's Invasive – citizen science in action as part of the RINSE project © RINSE

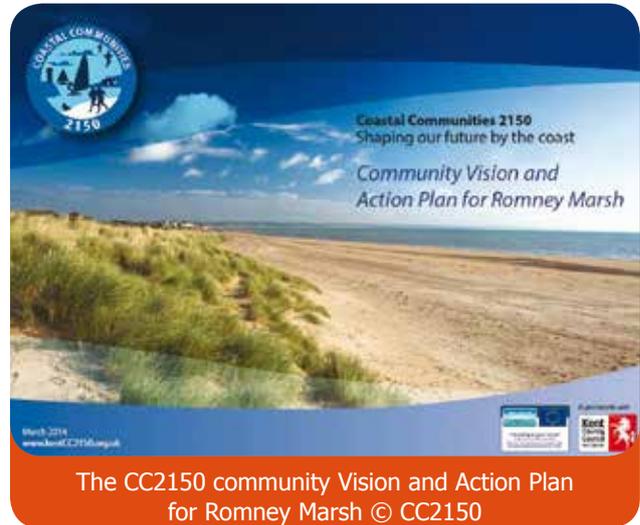
LESSON: INVOLVE THE COMMUNITY IN ACTION PLANNING

The most important element of participative engagement is truly getting the community to be involved in action planning. PRiME-C partners understood it is not always possible to get the whole of the community involved, but found managers should make it as easy as possible for stakeholders to access and participate in the planning process.

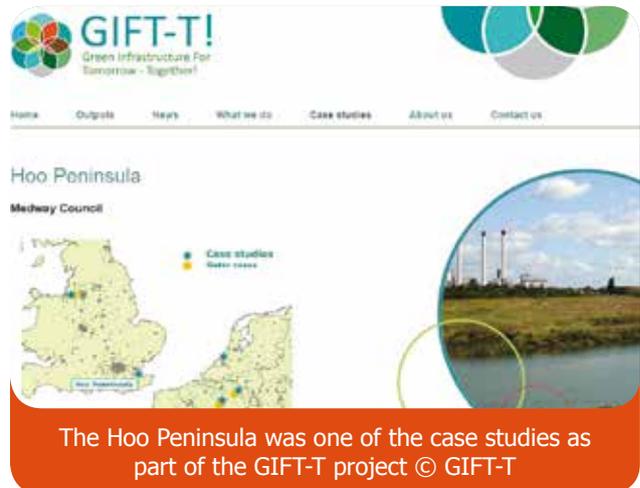
Best practice examples of community-based action planning

A key aim for CC2150 was to encourage local engagement in decision-making and preparing for the future in areas at particular risk of climate change. Supported by the project partners, local residents, businesses and community representatives in East Sussex and Kent were brought together to complete community-based planning. Using data gathered throughout the project and engagement activities, these groups drew up visions and action plans for their areas. They covered actions to prepare for adaptation to climate change and associated risks, such as sea level rise and more frequent extreme weather which might occur by the year 2150. These plans will be used to raise awareness amongst residents, businesses and decision-makers about how the areas could be affected. In addition, they will encourage people to actively influence change in the short, medium and long term.

GIFT-T partners tested techniques to use community green infrastructure planning to bring about improvements to the local community and economy. Greening the Gateway Kent and Medway ran a pilot on the Hoo Peninsula where two "Big Community Conversations" and over 30 individual community conversations have contributed to a process of creating a Green Infrastructure Business Plan for the area. Young people, farmers, environmental groups, representatives from Medway Council and from the National Grid took part, showing how local people and businesses could be part of the process. It is intended that the plan will help to improve the quality of the natural environment, as well as enhancing the vitality of their local social networks and the local economy.



The CC2150 community Vision and Action Plan for Romney Marsh © CC2150



The Hoo Peninsula was one of the case studies as part of the GIFT-T project © GIFT-T



CC2150 Flythrough. © CC2150



Action planning © CC2150

LESSON: USE KNOWLEDGE AND EXPERIENCE TO EMPOWER OTHERS

Considerable information has been learned and gathered through working on risk management projects. PRiME-C partners found that sharing their knowledge and experience can support other communities across the 2 Seas area in developing their own risk management programmes. In particular, it is important to present key information in a non-technical format which can be easily accessed by hard copy or online. Best practice guides are very effective resources for sharing detailed information and providing practical guidance for particular approaches or methodologies in risk management.

Best practice in developing practical guides

A key output from the C-SCoPE project was the development of a framework for achieving an integrated approach to planning and management for land and sea. Partners published "Why one size won't fit all: marine spatial planning in Belgium and Dorset" which introduces the concept of marine spatial planning, explains how the process works, and sets out methods for stakeholder engagement.

Arch-Manche partners produced a best practice guide for using archaeological, palaeoenvironmental, historical and artistic resources for coastal management, based on their experiences of delivering their PRiME-C project. The aim of the guide is to provide a practical resource for professionals to use in future management of coastal areas.

NOSTRA partners produced a guide to conducting Seascape Character Assessments, with the intention of providing the Marine Management Organisation with an approach that can underpin future strategic planning and decision-making for the Dover Strait, as well as enabling links to the European Landscape Convention.

CC2150 partners developed a practical guide of "best practice" which used over 40 case studies to explain how partners dealt with scenarios and solved problems. Case studies demonstrated the applicability of an idea or approach in a succinct, attractive, and accessible way. Photographs were used, while text was kept short to make maximum impact and keep readers attention.





A vision for Renesse ©Alterra

The value of clustering on risk management and engagement

The core objective of the PRiME-C cluster was to share and evaluate experiences in coastal risk management in order to identify learning and best practice that other organisations throughout the 2 Seas area could replicate.

The PRiME-C cluster achieved this through desk-top studies, collaborative activities, local and cross border events and networking. Bringing these partners together created an environment where ideas could cross-fertilise, cutting across geographical boundaries, mindsets and sector paradigms. Each PRiME-C partner contributed perspectives from expertise in a different discipline, type of organisation and geographic representation. Participating organisations and the INTERREG IVA 2 Seas Programme Authority recognise that multi-discipline networks engender a more holistic and integrated approach to coastal issues in the 2 Seas area.

In addition, partners brought with them wider networks, built-up through their project experience and risk management programmes. These included policy makers, governmental bodies, planners, businesses, thematic experts and community members. Through consolidating these networks, future projects have access to a large number of experts encompassing all aspects of ICZM.

Thoughts from PRiME-C Partners

"By working together, you learn from each other's experiences. You walk a path together on a topic and can share what you find on your road."

"We have learnt about others' circumstances, problems and possible solutions."

"An opportunity to share experiences and develop best practice."

"Using other partners' positive examples of adapting to coastal change has helped local communities appreciate they are not alone, and to take inspiration from others' solutions."

"Our partners often have very different Political and Municipal arrangements. But the people and community interests are very similar throughout our various project partners."

"A community likes to know what is happening at other places and especially how a different country is dealing with similar problems."

Conclusions from PRiME-C

In the 2 Seas area, coastal zones are among the areas most vulnerable to climate change, diminishing green spaces and declining biodiversity. These threats are primarily caused by people's interaction with the landscape and by physical changes to the environment. PRiME-C partners believe that the impacts of these risks will be far-reaching. Effects are already altering not only the lives and livelihoods of people in coastal communities across the 2 Seas area, but the balance of ecosystems. PRiME-C partners suggest that the objective for managers and policy makers is to make "win-win" or "no regret" decisions when implementing a coastal management programme.

Using the ICZM principles to underpin coastal risk management, partners identified three aspects to consider when designing future coastal risk management programmes:

- 1) know the risks and opportunities by identifying and assessing potential risks and vulnerabilities across a range of sectors;
- 2) be ahead of change by developing interdisciplinary strategies to minimise risk and increase resilience; and
- 3) build local ownership by actively including stakeholders in the management processes.

PRiME-C partners found that knowing the risks and opportunities allows for better decision-making on

how limited space in coastal areas is planned and managed. Successful risk management is built upon:

- Comprehensive risk assessment and profiling using multiple indicators to monitor and evaluate risks;
- Identifying new opportunities;
- Understanding the environmental, historical, social and psychological profile of an area;
- Investment in all areas of the seascape;
- Holistic and integrated planning;
- Defining a desired long-term future and develop several alternative routes to get there;
- Time and resources.

In addition, by allowing stakeholders and communities to participate in the planning process, individuals and groups are given mechanisms to help to shape their community's future and to prepare for changing conditions. Participative engagement can be facilitated using a variety of methods such as workshops, interactive exhibitions and outreach programmes. Informed and involved stakeholders will:

Informed and involved stakeholders will:

- Participate in decision-making by being more likely to identify the right decisions for their community, especially in complex cross-sector matters;
- Invest in productive relationships with managing organisations;
- Share local information and expertise;
- Support local ownership of risk management.

Recommendations for future risk management and engagement

Five cross border recommendations emerged from the cluster:

- 1. Develop partnerships between Member States, disciplines and types of organisations.** This provides a constructive mechanism for addressing both cross border and cross-sectors issues, and encourages a broader perspective on coastal risk and opportunities.
- 2. Value both the natural and built coastal environments.** Without understanding how coastal assets are used and valued, the risks posed to the coast's many different dimensions and users cannot be properly identified or managed.
- 3. Horizon scan.** Look towards the future while learning from the past, and plan adaptively to

find win-win solutions for identified risks. Recognise that decisions taken now must be made in the light of medium and longer term socio-economic and environmental change and may have cross border implications.

- 4. Get stakeholders involved.** Participative engagement is key to holistic planning and establishing local ownership. Make every effort to get stakeholders actively involved, so that they understand the risks and are motivated to play their part in risk management programmes.
- 5. Use what is already out there.** There are many tried and tested tools, techniques, methods, models, and frameworks for risk management and engagement available. These have proven track-records and are transferable across regions and sectors.

The next steps

Change, and its associated increase in risk, is likely to increase in rate and scale over the next century. However, with risk comes opportunity. Coastal zones are among the most productive areas in the 2 Seas area, offering a wide variety of valuable habitats and ecosystem services that have always attracted people. PRiME-C partners believe the wellbeing of populations and the economic viability of many businesses in coastal zones depend on the high quality natural environment of these areas. As such, a change in approach to coastal risk management is essential to plan for the future, as decisions we make now will directly influence the way we address future risks.

PRiME-C partners note that future cross border risk management projects can be delivered more effectively if lessons from the cluster are applied and best practices used to support the processes. The cluster has reinforced the awareness that coastal issues in the 2 Seas area have local implications, but result from much wider causes (such as climate change). Partners found that the decision-makers in coastal areas need to be more aware that actions in their local area can have an effect on other areas, and that there are benefits in working collaboratively with these other areas.

The cluster confirmed the value of future partnering between Member States, in bringing together innovative and effective working relationships between very different areas of expertise, such as archaeology, geomorphology, climate change and ecology. Sectoral or independent approaches to coastal management can lead either to disconnected decisions that risk undermining each other, or to inefficient use of resources and missed opportunities for more sustainable coastal development. PRiME-C partners consider that an integrated approach to risk management requires the co-ordinated application of different disciplines and policies at a regional level. Such collaborative working

should be supported to develop regional risk management tools and strategies.

Organisations should continue to collaborate through informal information-sharing and networking, as well as maintaining and growing active links through new projects. There is scope for developing the integration between the different subject experts, and for these experts to explore further how their particular areas of expertise can feed into and support others.

The findings from the work to date have contributed enormously to the understanding of risk in coastal areas, and how to monitor, manage and plan for risk across the 2 Seas area. However, the work has also identified gaps in knowledge and application of risk management programmes, such as the potential for further data sharing throughout Member States. There are two stages of work required: 1) learning more about these gaps, in particular why they exist and how significant they are through new tools, new ways of working or further research; and 2) bringing best practice and experience together in a single, easy to use resource, accessible across the 2 Seas area. This publication is the start of a process of much wider dissemination and information-sharing. Partners have seen the value in sharing with their own local and regional networks, and with other coastal areas facing similar circumstances.

The cross border benefits of PRiME-C results are current and robust best practices that are transferable across sectors, stakeholders and Member States. These results will contribute to and inform future risk management programmes and support the delivery of EU directives such as the Adaptation Strategy and the draft directive establishing a legal framework for maritime spatial planning and ICZM.



Sunset over the 2 Seas Area... © Eric Desaunois-CG62

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This issue is produced in the framework of the Cluster works, and coordinated by the INTERREG IV A 2 Seas Programme.

This cluster is led by Kent County Council. The cluster partnership also gathers Alterra (Wageningen UR), Provincie West-Vlaanderen, Département du Pas-de-Calais, TVES Research Centre (Université Lille 1), Maritime Archaeology Trust, Environment Agency, Norfolk County Council, and Gemeente Schouwen-Duiveland.

The contents of the publication reflects its authors' view and do not necessarily reflect the opinions of the institutions of the European Union.

The text in this publication is for information purposes only and is not legally binding.

This publication is entirely financed by the European Regional Development Fund (ERDF) through the INTERREG IV A 2 Seas Cross border Programme.



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Crossborder cooperation programme
2007-2013 Financed by the European Union
(European Regional Development Fund)

The complex block contains two logos at the top: on the left, the "2 Mers Seas Zeeën" logo with "INTERREG IV A" and "FRANCE - ENGLAND - VLAANDEREN - NEDERLAND" below it; on the right, the European Union flag. Below the logos is the text "Investing in your future" in quotes, followed by "Crossborder cooperation programme", "2007-2013 Financed by the European Union", and "(European Regional Development Fund)" in bold.

PRiME-C is fully funded by INTERREG, an initiative that was initiated by the European Union in 1989 and that strives to stimulate cooperation between specific EU regions. INTERREG IV covers the period 2007–2013. Strand A of INTERREG helps to finance projects that stimulate cross border cooperation. Within INTERREG IVA 53 programmes have been initiated. One of those programmes is the 2 Seas programme, which supports cross border projects in the coastal regions, adjoining the Channel and the North Sea, of France, England, Belgium and the Netherlands. In the first semester of 2012, after the closure of the 9th Call for Proposals, the INTERREG IVA 2 Seas programme reached its maturity with 86 approved projects. Most of the approved projects are well under way and the first results are being delivered. Therefore, the 2 Seas programme decided to launch capitalisation actions during the course of 2012. PRiME-C is such an approved capitalisation action aimed at consolidating, valorising and disseminating the various INTERREG IVA 2 Seas projects on which the PRiME-C Cluster is based.

**For further information on the 2 Seas Programme,
please visit our website:**

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The INTERREG IVA 2 Seas Programme is an EU funding programme which promotes cross border co-operation between partners from France, England, Belgium (Flanders) and The Netherlands. It aims to develop the competitiveness and the sustainable growth potential of maritime and non-maritime issues through the establishment and development of cross border partnerships.