

Coastal Zone
2011 Chicago, Illinois

JULY 17 TO 21, 2011
HYATT REGENCY CHICAGO



CLIMATE CHANGE AND COASTAL ADAPTATION: USING GIS AND VISUALISATION TO IDENTIFY ISSUES AFFECTING COASTAL COMMUNITIES IN ABERDEEN, SCOTLAND, UK

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AICSM - University of Aberdeen & Aberdeen City Council

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IMCORE
INNOVATIVE MANAGEMENT FOR EUROPE'S CHANGING COASTAL RESOURCE



IMCORE

- **IMCORE** = Innovative Management for Europe's Changing Coastal Resource
- Funded under the EU Interreg IVB programme (www.nweurope.eu) - North West Europe – 6m Euro
- Project goal is to promote a **trans-national, innovative and sustainable approach** to reducing the Ecological, Social and Economic impacts of climate change on the coastal resources of North West Europe.
- Partners composed of **expert couplets** from different countries in NW Europe (UK, Ireland, France, and Belgium)

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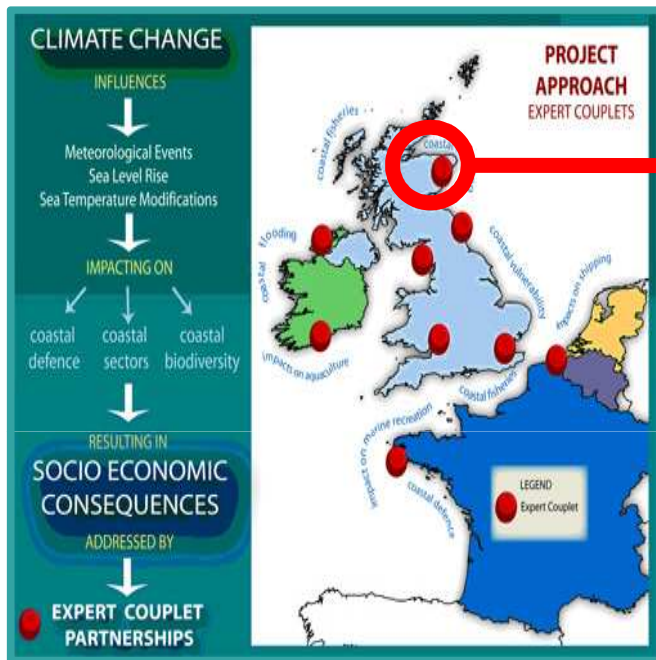


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EXPERT COUPLER NODES (ECNs)



UNIVERSITY OF ABERDEEN & ABERDEEN CITY COUNCIL:

Each ECN to (a) Identify **Climate Change Issues**, (b) **Develop Scenarios**, and (c) work towards an **Adaptation Strategy** for the ECN area

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EXPERT COUPLET NODES (ECNs)



Investing in opportunities

Expert Couplet for Aberdeen

Please download our PDF document to learn about the Expert Couplet for University of Aberdeen and Aberdeen City Council

[Click Here for the Aberdeen ECN Document](#)


Academic partner

Aberdeen Institute for Coastal Science and Management,
Aberdeen University, Scotland.

News Highlights

Conference announcement The Hague (NL), **Adapting to Coastal Change: local perspectives, 13th–14th September 2011**

New: Search our Database for **initiatives to manage coastal risks linked to climate change** with Tagazan



Littoral 2010 Conference, London (UK)

GIS SUPPORT & TOOLS

- ECN to develop a series of **Workshops** to interface with stakeholders

Three Workshops:

- Climate Change and Coastal Communities – Awareness and Education
- Climate Change Scenarios Workshop – Generate CC Scenario(s)
- Coastal Adaptation Strategy Workshop – Generate CC Adaptation Strategy
- University of Aberdeen – GIS and GeoVisualisation Support and Tools
- GIS and Visualisation – a recurring theme throughout IMCORE

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WORKSHOP 1 - CLIMATE CHANGE & COASTAL COMMUNITIES

- The aim of this workshop was to provide an introduction to climate change and the potential issues it will create in the future
- *What does Climate Change mean to you and your job?*
- *What are the major issues concerning Climate Change affecting you and your job?*
- *What are you and your organization doing about Climate Change?*

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SUMMARY OF POSSIBLE LOCAL IMPACTS

- Increased temperatures from 2 to 3.5 °C by 2080
- Increase in winter rainfall by 25%
- More intense storms
- Less snowfall by 90%
- Greater incidence of strong winds and larger waves
- Increased flood risks from rivers and seas, as well as possible sea level rise of 61cm
- Water temperature increase may affect geographical distribution of marine species and thus abundance of commercial species and marine mammals



(Source UK Climate Projections 09)

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WORKSHOP 2 - SCENARIOS WORKSHOP

● The aim of this workshop was to raise awareness about the Impact of Climate Change on **Flooding in Coastal Communities** in Aberdeen and Aberdeenshire. Delegates were given the opportunity to investigate some potential effects of Climate Change on flooding scenarios. They used **spatial datasets, GIS technology and other tools** to visualize the flooding scenarios

- Introduction
- Presentation
- Quiz
- Games
- Team work
- Physical and human aspects



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VISUALISATION

Macaulay Institute Landscape Visualisation Theatre



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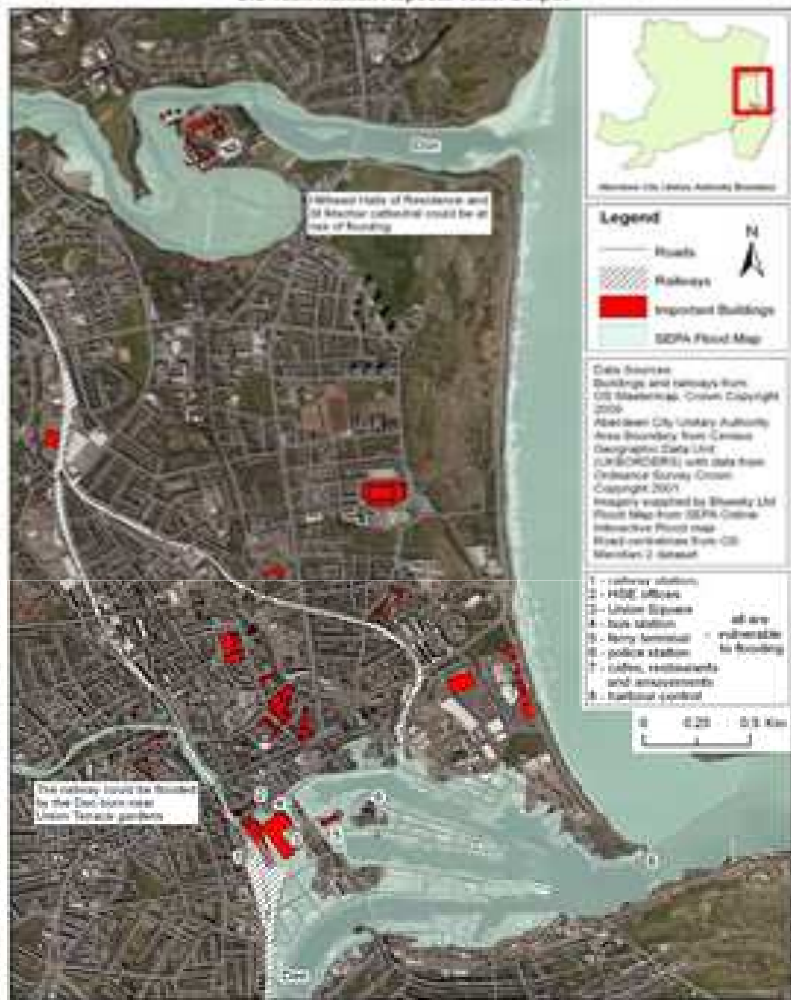
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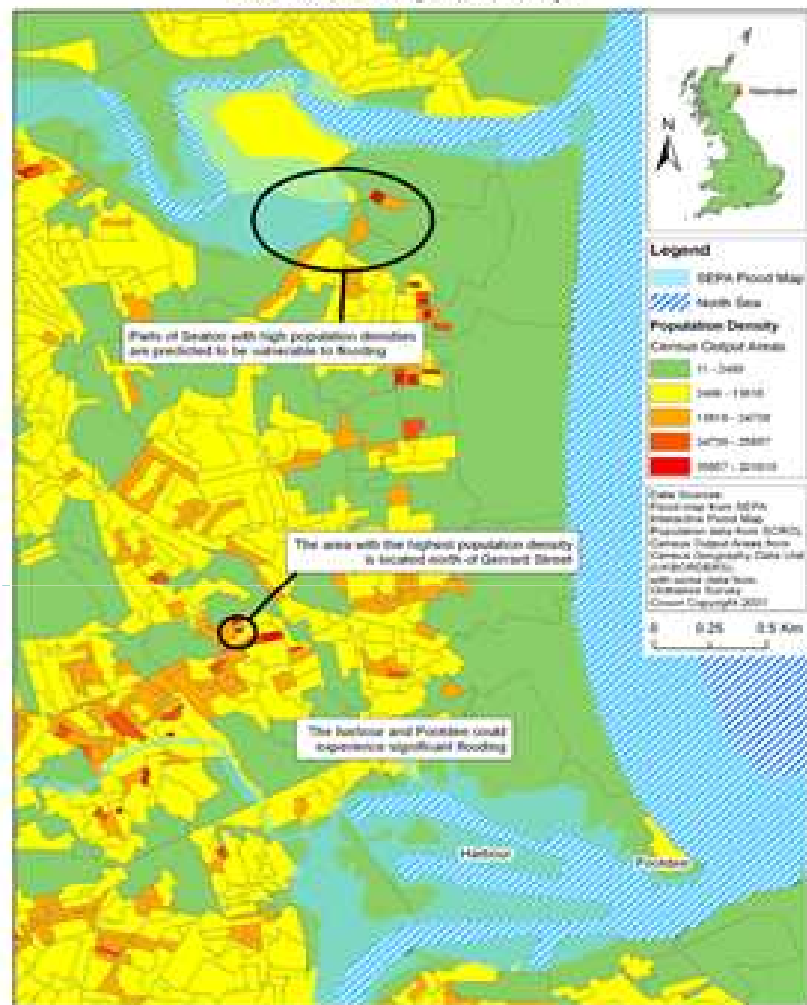
INNOVATIVE MANAGEMENT FOR EUROPE'S CHANGING COASTAL RESOURCE



Impact of Climate Change on Flooding in Coastal Communities Workshop 31st May 2010
GIS Task Human Aspects Team Output



Impact of Climate Change on Flooding in Coastal Communities Workshop 31st May 2010
GIS Task Human Aspects Team Output



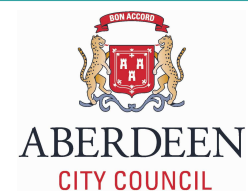
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WORKSHOP 3 - COASTAL ADAPTATION STRATEGY

- Developing a **Coastal Adaptation Strategy** for Aberdeen and Aberdeenshire
- Use **PESTLE analysis** and **Backcasting Scenario techniques** to develop the strategy
- Learn from the **good practice** and experience of two other **IMCORE Partners: Belgium and the East of England**



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ADAPTATION STRATEGY GUIDELINES



Guide for the development of climate change adaptation strategies

Methodology for IMCORE ECN areas

November 2010

DRAFT – IMCORE internal use only



WP 4.2 and 4.3



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PESTLE ANALYSIS

- **Selected scenario:** Coastal flooding in Aberdeen and Stonehaven is predicted to increase in the future and the aim is to reduce the socio-economic impact caused by this flooding to a minimum
- Use **PESTLE** analysis: Political, Economic, Social, Technological, Legal and Environmental analysis

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PESTLE ANALYSIS

Political

- Politicians aware of coastal issues and problems.
- Ensure participation of NGO's and community organizations in development of political initiatives (10).
- Regional policy developments closely linked to evidence-base and mainstream strategies (1).

Economic

- Coherent working between regional organisations leading to integrated and consistent regional approach (6, 10).
- Optimal economic development of coastal opportunities (11).
- Resourcing adequate to avoid short-term reactive planning (7, 9).

Social

- Community Based Organisations (CBO's) are active in coastal decision making.
- Local community and CBO representatives formally involved in regional management architecture.
- Support for entrepreneurship of coastal businesses that assist with sustainable development (11).

Technology

- Data collection and monitoring strategies coherent across the region - minimal gaps and minimal overlap (1).
- Integrated regional data storage and management with public access facility (1, 8).
- Appropriate technology in place to maintain high environmental quality, especially in terms of pollution (8).

Legal

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PESTLE ANALYSIS

- Clear leadership from EU and national policies.
- Integrated regional subsidiarity and implementation of national / international laws and policies (10, 12).
- Awareness of relevant laws and policies within community and NGO sectors.

Environmental

- Evidence base used to provide long-term view of environmental change (4).
- Communities aware of coastal change and potential impacts (6, 9).
- Active local participation in adaptation response such as habitat creation.

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BACKCASTING SCENARIO

- Fundamental to the overall process is to start this analysis from the preferred future and then work backwards to identify actions that will connect the future to the present
- Backcasting asks: *"if we want to attain a certain goal, what actions must be taken to get there?"*
- Backcasting elucidates the steps necessary to move back from the future to the present day and decide what is required to happen to make it happen.

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GROUP WORK

Group work: Brainstorming, Final analysis and PPT Presentation



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FUTURE?

- The IMCORE Project finishes at the end of October 2011
- How will the results of IMCORE be of value?
- How will the role of the ECN continue?
- Criteria of Interreg Projects – Lasting Impact on Society

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CURRENT POSITION

- Draft Climate Change Adaptation Strategy (CCAS)
- Review Aberdeen work to date
- Review CCAS – International
- Framework: UoA and ACC
- Questionnaire (IMCORE) - UoA and ACC
- Draft presented to Aberdeen City Council (ACC)
- Considered for Future Policy

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LESSONS LEARNED - 1

- Getting '*their*' attention
- Getting the '*right*' people involved
- Bringing '*climate change people*' together
- Having a long-enough lead / preparation time to project
- '*Raising awareness*' at a level beyond that of the 'media/press'
- '*Convincing people*' that climate change is important
- Getting '*Priorities*' right – at a time when other 'issues' e.g. the local economy, energy are deemed to be/ perceived to be more important

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LESSONS LEARNED - 2

- Keeping the '*momentum*' going 'after' the project ends
- Devising a '*do-able*' strategy
- '*Educating*' – the future generations – fitting CC to the school curriculum
- '*Packaging*' up what has been done here – and output from other projects e.g. **CoastAdapt** into something '*usable*' e.g. tools (<http://www.coastadapt.org/>)
- Distance Learning Tool (DLT) (www.coastaladaptation.eu)

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ABERDEEN CLIMATE CHANGE WEBSITE

The screenshot shows a website layout with a green and white color scheme. At the top right, there are links for 'Home | Contact | Forum' and a search bar. The main title is 'The Climate Change Forum: Aberdeen and Aberdeenshire'. Below this is a navigation menu with buttons for 'Home', 'About', 'Climate Change', 'News', 'Events', 'Downloads', 'Forum', 'GIS', and 'Sitemap'. The main content area is divided into three columns. The left column features a large image of an eye with a green globe as the iris, followed by a smaller image of a beach. Below these are sections for 'events' and 'news', each containing placeholder text and a 'more...' link. The middle column is titled 'The Climate Change Forum' and contains several paragraphs of placeholder text. The right column features a large image of a coastal scene and a 'FEATURE' section with placeholder text. At the bottom of the page, contact information is provided: 'The University of Aberdeen, King's College, Aberdeen, AB24 3FX' and 'Tel: +44 (0)1224-272000'.

www.aberdeencclimatechange.net

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RAISING AWARENESS - LEAFLET

Aberdeen Climate Change Action Plan	What is IMCORE?	CLIMATE CHANGE	Regional impacts	Local coastal examples
<p>The Action Plan was written by Aberdeen City Council on the basis of what we can do practically in Aberdeen in line with international and national advice on climate change. It indicates actions already underway by various services within the Council or in partnership with other agencies. The Five actions centre around:</p> <ul style="list-style-type: none"> Climate change community awareness Climate change business awareness Climate change and education Climate change and energy use in the home Climate change and energy use in the business centre 	<p>IMCORE (Innovative Management for Europe's Changing Coastal Resource) stands to promote an innovative and sustainable approach to reducing the impacts of climate change on coastal areas in North West Europe. It is not so much about predicting effects but offering suggestions of how we can all adapt to change. IMCORE recognizes the need for adaptations within coastal sectors such as fisheries, aquaculture, ports, shipping, marine recreation, and coastal defence. The scientists and practitioners involved in IMCORE span Ireland, the UK, France, Belgium and the Netherlands. There is a regional working partnership of IMCORE here in Aberdeen, working on coastal regeneration projects.</p>	 <p>CLIMATE CHANGE</p> <p>in a coastal context</p>	<p>What is climate change?</p> <p>Climate change is a natural phenomena but one that can also be speeded up by human activities. The extent to which temperature change over the last 100 years is due to human activities has been studied by looking at patterns of change across the earth's surface, and in the atmosphere and the ocean. The contributions of natural effects e.g. variations in the sun's output and volcanoes have also been studied. Natural effects were found to be unable to account for all the observed warming. Only when greenhouse gases emitted by human activities are included can the warming be explained.</p> <p>What are the drivers and the impacts?</p> <p>Natural drivers include: changes in the earth's orbit, changes in sun intensity, volcanic eruptions (emitting greenhouse gases) and oceanic and atmospheric circulation patterns. Anthropogenic drivers include: greenhouse gas emissions from burning fossil fuels) and land use (cover changes (e.g. deforestation).</p> <p>In the coastal zone northwest Europe, the main impacts include: sea level rise, extreme weather events, sea temperature and chemistry changes, air temperature changes and changes in precipitation (rainfall and snowfall). The following map and series of illustrations are used to explain what these impacts might really mean for coastal communities.</p> <p>Climate change in a coastal context</p> <p>Many people living in Aberdeenshire, particularly in the coastal zone, have questions about climate change that they don't have answers to or might be worried about the possible impacts. This leaflet aims to explain the most likely coastal impacts of climate change based on the knowledge experts have so far. Aside from the possible problems, here are presented some practical examples of what is being done to combat climate change problems and positive ways in which everybody can get involved in the solutions.</p>	 <p>Regional impacts:</p> <ul style="list-style-type: none"> SEA LEVEL RISE: (max. 24 metres by 2080) may lead to the loss of coastal habitats e.g. wetlands. EXTREME WEATHER EVENTS: such as storms may lead to severe coastal erosion in places. SEA TEMPERATURE CHANGES: may cause the loss of native species and an increase in non-native. AIR TEMPERATURE CHANGES: may be positive for tourism, but may mean an increase in pollution and pests e.g. mosquitoes. PRECIPITATION CHANGES: such as heavier rainfall may increase flooding from rivers. SEA CHEMISTRY CHANGES: may lead to ocean acidification meaning some marine life will have problems e.g. in shell formation. <p>Local coastal examples:</p> <ul style="list-style-type: none"> Elgin: Decreased rainfall in summer may cause loss of some crops and changes to moorland habitats such as those at Scottish Nature Reserve. Don: Increase in winter rainfall by up to 25% may cause increased flood risks from rivers, such as the Don. Aberdeen: Increased temperatures (from 2°C to 3.5°C by 2080) may positively effect coastal tourism in locations like Aberdeen beach. Perth: Coastal erosion has had a severe effect on Aberdeen coast. A beach nourishment program and coastal defences are in place here. This has both positive and negative impacts on many sectors e.g. the shipping, transport and tourism. Dundee: The South Aberdeenshire Coastal Regeneration Project (SACRP) focuses on Higg Bay and Ioca area. Proposed projects here include a marine resource centre, boat ramp, artificial reef, coastal footpath, beach ridges and landscaping.
<p>What can you do?</p> <p>Energy use: Use a greater proportion of energy from renewable sources such as wind, water and biomass. Reduce the number of 'heating' days in our office buildings.</p> <p>Flooding: Update your existing emergency flood plan in conjunction with the emergency services.</p> <p>Land management: Develop water storage systems to prevent summer droughts.</p> <p>Transportation: Reduce staff travel to work by car and reduce car business mileage.</p> <p>Waste: A new 'attitude' to waste reduction and a commitment to recycling.</p> <p>Lobbying: Make MSPs and MEPs are aware of the need for change in policy at national and international level.</p> <p>Education: Enable children to make wise decisions about the environment and resource use.</p>	<p>Sources of further information</p> <p>IMCORE: http://www.imcore.eu</p> <p>Department of Environment, Food and Rural Affairs This site gives details of the Government's policies on climate change. https://www.defra.gov.uk/</p> <p>The Hadley Centre Gives details of the latest climate change predictions http://www.met-office.gov.uk/research/hadleycentre</p> <p>UK Climate Impacts Programme Government help for organisations to assess and adapt to climate change. http://www.ukcip.org.uk/</p> <p>Energy Efficiency Best Practice UK Government advice on how cut their energy bills by 10-20%. http://www.energy-efficiency.gov.uk/</p> <p>Energy Saving Trust Provides many tips on how to save energy around the home. http://www.est.org.uk/</p> <p>Climate change An interactive website for school children and young people aged between 7 and 16. http://www.defra.gov.uk/environment/climate-change/schools/index.htm</p> <p>With thanks to:</p>	<p>A resource for the local people of Aberdeenshire</p>		

SciArt Solutions Limited – www.sciartsolutions.co.uk



GIS VIDEO TUTORIALS

The screenshot shows the Aberdeen Climate Change Forum website. At the top right, there are links for Home, Contact, and Forum, along with a search bar. The main header reads "Aberdeen Climate Change Forum" with the tagline "climate change and your community". A navigation menu includes Home, About, Climate Change, News, Events, Downloads, Forum, GIS (highlighted), Gallery, and Sitemap. On the left, there is a sidebar with a "News" section featuring "Aberdeen IMCORE - Pictures" (dated 20 December 2010) and "Aberdeen ECN to host IMCORE project meeting 2 - 4 November" (dated 26 October 2010). The main content area is titled "GIS" and "Video tutorials". It contains a paragraph explaining the series of video tutorials designed to introduce ArcGIS for studying climate change impacts. Below this, two video tutorials are listed with their respective topics and steps: "Video Tutorial 1 - Evaluation of population vulnerable to flooding" and "Video Tutorial 2- Finding the highest and lowest elevations in an area". On the right, there is a "GIS" section with a photo of a coastal path and text explaining that users can download training plans and find ArcGIS and Database tutorial links.

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RAISING AWARENESS - ADVERTISING CAMPAIGN



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EDUCATION - FIELDTRIPS & WORKSHOPS



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MEDIA & PRESS RELEASES



← Press & Journal - Newspaper



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ROADSHOW



- Aberdeen City – Public display (Union Square), Schools and Offshore Europe
- Aberdeenshire – Public displays, Schools

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DISTANCE LEARNING TOOL (DLT)

The screenshot shows the CoastalAdaptation.eu website. The header includes the site name and logo, and a navigation menu with items like Home, Why Adapt, Guidance, 9 Experiences, ToolBOX, and About IMCORE. The main content area features a 'Guidance: Develop your Coastal Adaptation Strategy' section with a three-step process: 1. Identifying the issues, 2. Developing future scenarios, and 3. Designing the adaptation strategy. Below this is a 'Learning by doing: 9 Experiences' section with a map of North West Europe and callouts for specific coastal adaptation projects. On the right, there is a 'ToolBOX' section with a search bar and a 'Top 10 lessons' section. The footer contains logos for the University of Aberdeen, IMCORE, and Aberdeen City Council.

CoastalAdaptation.eu
Local adaptation to Coastal Climate Change in North West Europe

Investing in Opportunities
NWE
INTERREG IVB

Home Why Adapt Guidance 9 Experiences ToolBOX About IMCORE

Home

Guidance: Develop your Coastal Adaptation Strategy

Let us guide you through the steps we took to develop our adaptation Strategies through an introduction and "before you start" tips and our rapid e-learning course.

Engaging stakeholders
1 Identifying the issues
2 Developing future scenarios
3 Designing the adaptation strategy
Building institutional capacity

Learning by doing: 9 Experiences

Each area across North West Europe has responded to the challenge of developing a strategy to adapt to climate change under their own, unique priorities and circumstances.
Pick your choice!

Marine leisure as an opportunity while coasts change.. COASTAL ADAPTATION IN LOUGH SWILLY.

Marine leisure as an opportunity while coasts change.. COASTAL ADAPTATION IN LOUGH SWILLY.

Some outstanding issue/tool/etc from each ECN

Marine leisure as an opportunity while coasts change.. COASTAL ADAPTATION IN LOUGH SWILLY.

ToolBOX

text here

"It is people's life and livelihoods that will be affected by coastal change"

change ENGLAND Adaptation together Identifying strategy Climate issues Future management EAST

Top 10 lessons

text here

"It is people's life and livelihoods that will be affected by coastal change"

LinkedIn

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DISTANCE LEARNING TOOL (DLT)

CoastalAdaptation.eu



Local adaptation to Coastal Climate Change in North West Europe



Home Why Adapt Guidance 9 Experiences ToolBOX About IMCORE


Home > 9 Experiences > Aberdeen beach

Aberdeen beach




There are a wide range of threats to Aberdeen and its economic activity posed by the potential of climate change. The severity of the threat depends on the magnitude of the effects, which cannot be accurately forecast, but for the short term this appears to be relatively low for individual effects. Nevertheless, the cost of mitigating all the impacts is likely to rise steadily and will represent an increasing burden for the city. A lack of knowledge, funds, experience, strong public and executive desire to robustly address climate change issues is currently impeding significant progress, but projects such as IMCORE aim to help improve the situation.

Climate change drivers and Coastal management



Aberdeen beach and the Queens Links area - situated directly behind it - (to the West) are important assets for Aberdeen City, while the nearby harbour is a major contributor to the local and regional

ToolBOX



text here


It is people's life and livelihoods that will be affected by coastal change"

ENGLAND Climate together Identifying Adaptation issues EAST future change management strategy

Top 10 lessons

text here

It is people's life and livelihoods that will be affected by coastal change"





Adapting to Coastal Change: local perspectives

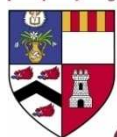


International Conference, Field Trip and Workshop

The Hague - September 13th - 15th, 2011

<http://imcore.eu/TheHagueConference2011/>

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THANK YOU...

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