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# Adaptation
## preparing for a changing climate

*A joint presentation by*
*DG Climate Action &*
*DG Research & Innovation*


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# Contents

- Some facts and impacts of climate change
- The EU Adaptation Strategy and its implementation
- Mainstreaming of climate change adaptation in EU funding and in the maritime sector

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### Headline statements from the Summary for Policymakers*

#### Observed Changes and their Causes

**Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems.**

Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen.

Anthropogenic greenhouse gas emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever. This has led to atmospheric concentrations of carbon dioxide, methane and nitrous oxide that are unprecedented in at least the last 800,000 years. Their effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are *extremely likely* to have been the dominant cause of the observed warming since the mid-20th century.

In recent decades, changes in climate have caused impacts on natural and human systems on all continents and across the oceans. Impacts are due to observed climate change, irrespective of its cause, indicating the sensitivity of natural and human systems to changing climate.

Changes in many extreme weather and climate events have been observed since about 1950. Some of these changes have been linked to human influences, including a decrease in cold temperature extremes, an increase in warm temperature extremes, an increase in extreme high sea levels and an increase in the number of heavy precipitation events in a number of regions.

#### Future Climate Changes, Risks and Impacts

**Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems. Limiting climate change would require substantial and sustained reductions in greenhouse gas emissions which, together with adaptation, can limit climate change risks.**

Cumulative emissions of carbon dioxide largely determine global mean surface warming by the late 21st century and beyond. Projections of greenhouse gas emissions vary over a wide range, depending on both socio-economic development and climate policy.

Surface temperature is projected to rise over the 21st century under all assessed emission scenarios. It is *very likely* that heat waves will occur more often and last longer, and that extreme precipitation events will become more intense and frequent in many regions. The ocean will continue to warm and acidify, and global mean sea level to rise.

Climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development.

Many aspects of climate change and associated impacts will continue for centuries, even if anthropogenic emissions of greenhouse gases are stopped. The risks of abrupt or irreversible changes increase as the magnitude of the warming increases.

* Headline statements are the overarching highlighted conclusions of the approved Summary for Policymakers which, taken together, provide a concise narrative. The four statements in boxes here are those summarizing the assessment in the Summary for Policymakers, sections 1-4.



## Observed changes and their causes:
- Warming of the climate system is unequivocal
- Widespread impacts on human and natural systems
- Changes in many extreme weather and climate events

## Future climate changes, risks and impacts:
- Continued GHG emissions will cause further warming
- Rising surface temperature for all emission scenarios
- More frequent and longer lasting heat waves
- More frequent and intense precipitation events typically
- Ocean warming, acidification, global mean sea level rise

## Pathways for adaptation, mitigation, sustainable dev.:
- Quick emission reductions will reduce risks, costs and challenges, help climate-resilient sustainable development

## Adaptation and mitigation:
- No single option, but integrated responses, enabling factors

http://www.ipcc.ch/

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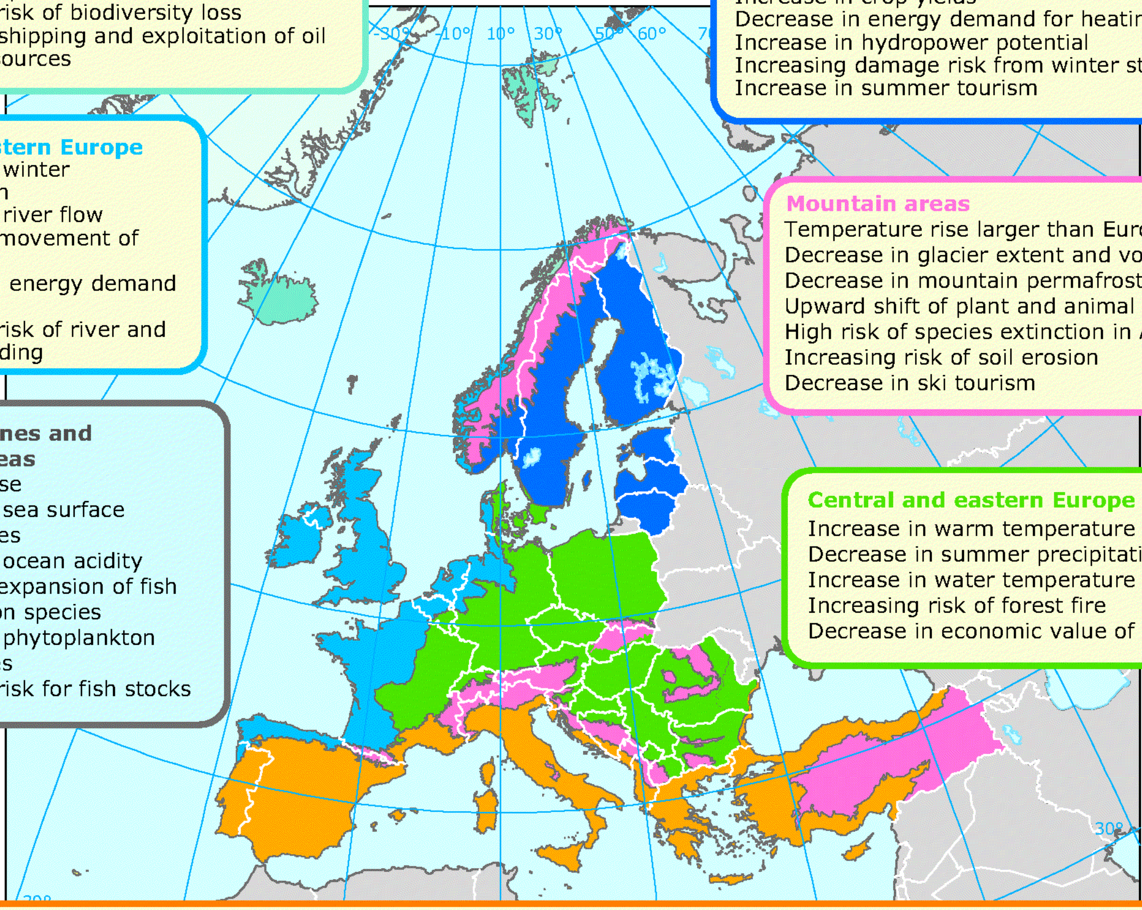
# Territorial climate impacts

**Arctic**
Temperature rise much larger than global average
Decrease in Arctic sea ice coverage
Decrease in Greenland ice sheet
Decrease in permafrost areas
Increasing risk of biodiversity loss
Intensified shipping and exploitation of oil and gas resources

**Northern Europe**
Temperature rise much larger than global average
Decrease in snow, lake and river ice cover
Increase in river flows
Northward movement of species
Increase in crop yields
Decrease in energy demand for heating
Increase in hydropower potential
Increasing damage risk from winter storms
Increase in summer tourism

**North-western Europe**
Increase in winter precipitation
Increase in river flow
Northward movement of species
Decrease in energy demand for heating
Increasing risk of river and coastal flooding

**Mountain areas**
Temperature rise larger than European average
Decrease in glacier extent and volume
Decrease in mountain permafrost areas
Upward shift of plant and animal species
High risk of species extinction in Alpine regions
Increasing risk of soil erosion
Decrease in ski tourism



**Coastal zones and regional seas**
Sea-level rise
Increase in sea surface temperatures
Increase in ocean acidity
Northward expansion of fish and plankton species
Changes in phytoplankton communities
Increasing risk for fish stocks

**Central and eastern Europe**
Increase in warm temperature extremes
Decrease in summer precipitation
Increase in water temperature
Increasing risk of forest fire
Decrease in economic value of forests

**Source: EEA**

**Mediterranean region**
Temperature rise larger than European average
Decrease in annual precipitation
Decrease in annual river flow
Increasing risk of biodiversity loss
Increasing risk of desertification
Increasing water demand for agriculture
Decrease in crop yields
Increasing risk of forest fire
Increase in mortality from heat waves
Expansion of habitats for southern disease vectors
Decrease in hydropower potential
Decrease in summer tourism and potential increase in other seasons

# The EU Adaptation Strategy: Why action at the EU level?

- Adopted in April 2013
- Contributing to a climate resilient EU
- Better balancing adaptation with mitigation agendas
- Integrating adaptation in key EU policies and funds
- Benefiting from economies of scale for addressing knowledge gaps and dissemination objectives
- Addressing cross-border issues
- EU financing for adaptation
- Promoting action by the private sector

# The EU Strategy in a Nutshell

## Priority 1: Promoting action by Member States

**Action 1. Encourage MS to adopt Adaptation Strategies and action plans**

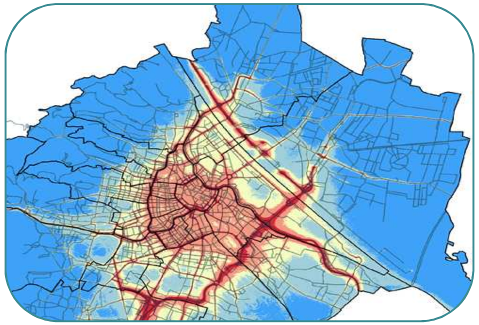
**Action 2. LIFE funding, including adaptation priority areas**

**Action 3. Promoting adaptation action by cities along the Covenant of Mayors initiative**

## Priority 2: Better informed decision-making

**Action 4. Knowledge-gap strategy**

**Action 5. Climate-ADAPT**



## Priority 3: Key vulnerable sectors

**Action 6. Climate proofing the Common Agricultural Policy, Cohesion Policy, and the Common Fisheries Policy**

**Action 7. Making infrastructure more resilient**

**Action 8. Promote products & services by insurance and finance markets**

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# Priority 1: Promoting action by Member States

**Action 1. Encourage MS to adopt Adaptation Strategies and action plans**

**Action 2. LIFE funding, including adaptation priority areas**

- cross-border floods management, coastal management, urban environment, mountain and island areas, drought-prone areas (water, desertification, fire risks)

**Action 3. Promoting adaptation action by cities along the Covenant of Mayors initiative: Mayors Adapt**

# Priority 2: Better informed decision-making

**Action 4. Knowledge-gap strategy**

- Identify and prioritise knowledge gaps
- Feed this into programming Horizon 2020

**Action 5. Climate-ADAPT**

- Develop interfaces with other databases and climate services

## Marine and fisheries

EU policies and instruments include the Integrated Maritime Policy (and action plan) allowing for the sustainable development of sea-related activities. Its environmental pillar, the Marine Strategy Framework Directive aims to deliver a 'good environmental status' of the marine environment by 2020. The Common Fisheries Policy is being reformed to achieve sustainable fisheries. The EU strategy on adaptation to climate change includes a Staff Working Document on marine issues and a staff working document on climate change adaptation in the Maritime and Fisheries Fund operational programmes was also published.

Read more

## Search results

- Publications and reports (136)
- Information portals (46)
- Guidance (41)
- Tools (7)
- Indicators (6)
- Research and knowledge projects (94)
- Adaptation options (6)
- Case studies (2)
- Organisations (36)

Share your information

## Indicators

- Ocean heat content
- Phenology of marine species
- Arctic and Baltic sea ice
- Distribution of marine species
- Ocean acidification
- Sea surface temperature

## Resources

- Climate Change and Water, Coasts and Marine issues
- IPCC Fifth Assessment Report, WGI Chapter 13: Sea Level change
- IPCC Fifth Assessment Report, WGI Chapter 3: Observations: Ocean
- IPCC Fifth Assessment Report, WGII Chapter 5: Coastal systems and low-lying area
- IPCC Fifth Assessment Report, WGII Chapter 6: Ocean Systems
- GMES Ocean Monitoring and forecasting (MyOcean)
- UK Ocean Acidification Research

## Multimedia

- NATURA 2000: Safeguarding Europe's biodiversity

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# Priority 3: Key vulnerable sectors

## Action 6. Climate proofing the CAP, Cohesion Policy, and the Common Fisheries Policy

- Guidance
- Capacity building

## Action 7. Making infrastructure more resilient

- Mapping standards through CEN/CENELEC/ETSI
- Guidelines for project developers

## Action 8. Promote products & services by insurance and finance markets

- Green paper insurance of disasters
- Stakeholder dialogue

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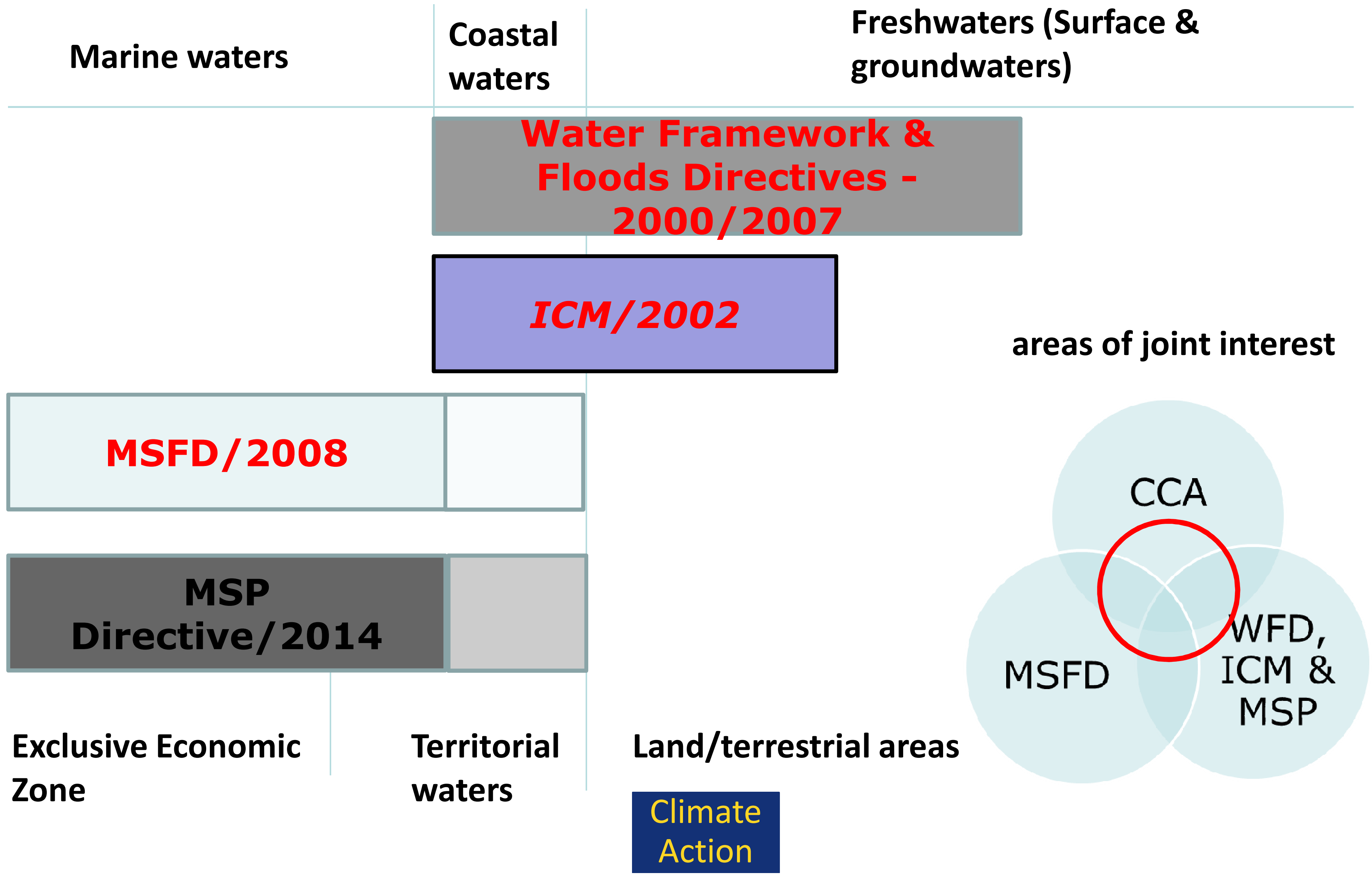
# ICM/MSP


Marine waters
Coastal waters
Freshwaters (Surface & groundwaters)
Water Framework & Floods Directives - 2000/2007
ICM/2002
areas of joint interest
MSFD/2008
MSP Directive/2014
CCA
MSFD
WFD, ICM & MSP
Exclusive Economic Zone
Territorial waters
Land/terrestrial areas
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# Maritime Security Strategy & Action Plan

- Assess maritime transport infrastructure's resilience to climate change in order to
  - Minimize security risk caused by man-made and natural disasters
  - Enhance readiness and preparedness of MS and EU capacities to respond to security threats

- Best practices to be shared on Climate-ADAPT

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# Resilience of infrastructure: major projects

- **Main objective –** to climate proof major projects under the European Structural and Investment Funds

- **Scope: major infrastructure projects (transport, energy, constructions, water, ICT)**

- In project proposals to the ESIF, the following information is to be provided
  - Contribution to EU CC objectives
  - Climate Change mitigation needs
  - Risk and vulnerability of the project to effects of CC
  - Risks related to CC and Disaster Risk Reduction
  - Appropriate measures taken to ensure resilience

# Resilience of infrastructure: standards

- **Main objective -** climate resilient infrastructure in 3 priority sectors

  1. transport infrastructure– including maritime transport infrastructure;
  2. energy infrastructure;
  3. buildings/construction;
     - **plus** ICT infrastructures that are closely interconnected with, and support the functioning of the ones above.

- **Scope:** existing European standards and European standardisation deliverables

- all types of standards managed by the ESOs (e.g. for products, systems, services, testing and measurements, processes) - excluding the EUROCODES.

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# Mainstreaming climate action in the Multiannual Financial Framework - MFF (1)

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- **Climate policies**
  - Mitigation -> low-carbon societies and economies in the EU
  - Adaptation -> climate resilience
- **Europe 2020 strategy - contributes to the 20/20/20 climate change and energy sustainability targets**
  - Greenhouse Gas Emissions 20% lower than 1990
  - 20% of energy from renewable energy sources
  - 20% increase in energy efficiency
- **Political objective: Minimum 20% of the MFF (EU budget) will support climate action objectives**

  "Climate action objectives will represent at least 20% of EU spending in the period 2014-2020 and therefore be reflected in the appropriate instruments to ensure that they contribute to strengthen energy security, building a low-carbon, resource efficient and climate resilient economy that will enhance Europe's competitiveness and create more and greener jobs.“

  *(Conclusions of the European Council on MFF 2014-2020, 8 February 2013)*

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# Mainstreaming climate action in the Multiannual Financial Framework - MFF (1)

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- **The MFF 2014-2020**
  - Lays down the maximum annual amounts ('ceilings') which the EU may spend in different policy fields
  - € 960 bn (2011 prices), over € 1 082 bn (current prices)
- **Horizon 2020, the EU Framework programme for Research and Innovation – Total budget of € 70.2 bn (2011) - € 80 bn (current prices)**
  - 35% of budget to be spent for climate-related R&I
- **European Structural and Investment Funds (ESIF)**
  - Over 43% of the MFF; 5 funds:
    - European Regional Development Fund (ERDF)
    - Cohesion Fund (CF)
    - European Social Fund (ESF)
    - European Agricultural Fund for Rural Development (EAFRD)
    - European Maritime and Fisheries Fund (EMFF)

# Climate mainstreaming (mitigation, adaptation) Fact Sheets

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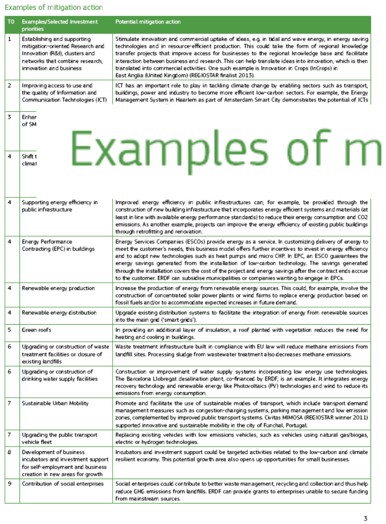
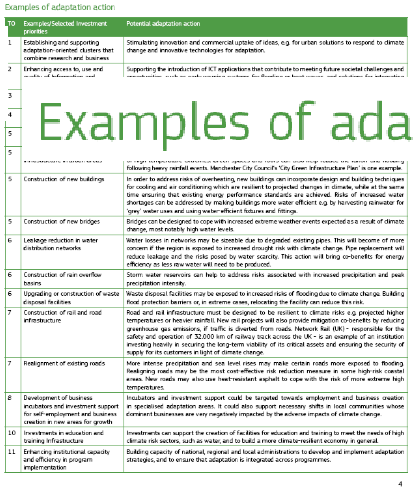
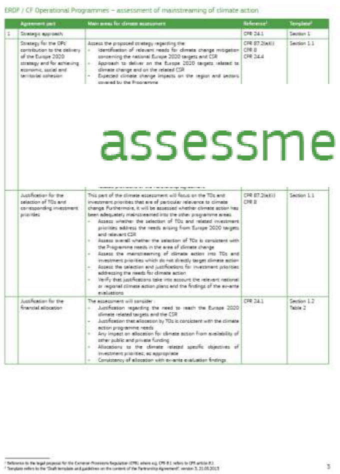


## Examples of mitigation action



## Examples of adaptation action

## assessment of mainstreaming of climate action

http://ec.europa.eu/clima/publications/index_en.htm#Mainstreaming

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# EU Research & Innovation for Climate Change Adaptation through Nature-Based Solutions

Research and
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# Nature-based solutions

- **Solutions inspired or supported by nature that simultaneously provide environmental, social and economic benefits and help to build resilience**

- **Bringing of more nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions**

- **Funding for R&I through Societal Challenge 5 of Horizon 2020, 'Climate Action, Environment, Resource Efficiency and Raw Materials'**
  - Large-scale demonstration for climate resilience and hydro-meteorological risk reduction through nature-based solutions

# EC Plenary Session on Nature-Based Solutions for Climate Change Adaptation

- **Tomorrow, 14:00-16:00**
- **Auditorium 10**

- **EU R&I for Nature-Based Solutions**
  - Birgit de Boissezon, DG Research and Innovation
- **Scientific perspectives**
  - Pam Berry, Oxford University
- **End-users' experiences & perspectives**
  - Water Safety in the Netherlands, Arjan Ruijs, PBL
  - Coastal threats & solutions in Emilia-Romagna, Italy, Luisa Perini, Region of Emilia-Romagna
  - Resilience in Cities, Holger Robrecht, ICLEI

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# Thank you for your attention

- **More on:**
  - EU Adaptation Policies: http://ec.europa.eu/clima/policies/adaptation
  - Climate-ADAPT Homepage: http://climate-adapt.eea.europa.eu/
  - Mayor´s Adapt: http://mayors-adapt.eu/
  - HORIZON 2020 http://ec.europa.eu/programmes/horizon2020/
  - EU R&I on Nature-Based Solutions

    http://ec.europa.eu/research/environment/index_en.cfm?pg=nature-based-solutions