

International workshop “Impact of climate change on forest work”,
11-12 November 2013, Geneva

Climate change impacts, vulnerability and adaptation in Europe

André Jol

Head of group vulnerability and adaptation, EEA



EEA member and cooperating countries



EEA coverage

	Member countries		Cooperating countries
---	------------------	---	-----------------------

*Kosovo under UNSCR 1244/99

The EEA is a specialised agency of the European Union

The EEA aims to support sustainable development and to help achieve significant and measurable improvement in Europe's environment through the provision of timely, targeted, relevant and reliable information to policy makers and the public.





The Adaptation Strategy package

- **Communication**
- **Impact assessment**
- **Green Paper on the insurance of natural and man-made disasters**
- *Commission Staff Working Documents on:*
 - Climate change adaptation, **coastal** and **marine** issues;
 - Adaptation to climate change impacts on human, animal and plant **health**;
 - Adapting **infrastructure** to climate change;
 - Climate change, environmental degradation and **migration**;
 - Technical guidance on integrating climate change adaptation in programmes and investments of **Cohesion Policy**;
 - Principles and recommendations for integrating climate change adaptation considerations under the 2014-2020 **rural development programmes**;
 - Guidelines on **developing adaptation strategies**.



Why an EU Strategy?

- **Cross-border** dimensions
- EU competence in **common policies** affected by CC
- **Economies of scale** in capacity-building, research, data-gathering and knowledge transfer
- Different capacities and vulnerabilities across regions and population call for **solidarity**
- **EU Funding**



Strategy objective and priorities

To contribute to a climate-resilient Europe

3 Priorities:

- ❑ 1. Promoting action by Member States
- ❑ 2. Better informed decision making
- ❑ 3. Promoting adaptation in key vulnerable sectors

EU adaptation strategy proposed actions

- Action 1: Encourage all Member States to adopt comprehensive adaptation strategies
- Action 2: Provide LIFE funding to support capacity building and step up adaptation action in Europe. (2013-2020)
- Action 3: Introduce adaptation in the Covenant of Mayors framework (2013/2014).
- Action 4: Bridge the knowledge gap (H2020, JPI, Copernicus)
- Action 5: Further develop Climate-ADAPT as the 'one-stop shop' for adaptation information in Europe.
- Action 6: Facilitate the climate-proofing of the Common Agricultural Policy (CAP), the Cohesion Policy and the Common Fisheries Policy (CFP).
- Action 7: Ensuring more resilient infrastructure
- Action 8: Promote insurance and other financial products for resilient investment and business decisions.

2014-2020 Multi-annual Financial Framework share of climate-related EU expenditure of 20% (35% for research)



EU forestry strategy (Commission, Sep. 2013)

- Responds to **new challenges** facing forests and the forest sector.
- **Sustainable** forest management and the **multifunctional** role of forests remain key
- Forests are important for rural development, job creation, the environment - especially for biodiversity; for forest-based industries; bioenergy; and for reducing greenhouse gas emissions
- Mentions the importance of actions to maintain and enhance **forest's resilience and adaptive capacity**.
- Calls for a Forest Information System to be set up and for Europe-wide harmonised information on forests to be collected.



The screenshot shows the European Commission website page for the EU Forest Strategy. The page is titled "AGRICULTURE AND RURAL DEVELOPMENT" and features the European Commission logo. The main content area is titled "The new EU Forest Strategy" and includes the following text:

On 20 September 2013 the Commission adopted a new EU Forest Strategy which responds to the new challenges facing forests and the forest sector.

The new Strategy gives a new framework in response to the **increasing demands** put on forests and to significant **societal and political changes** that have affected forests over the last 15 years.

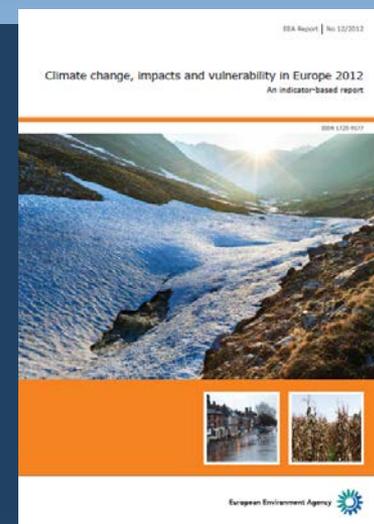
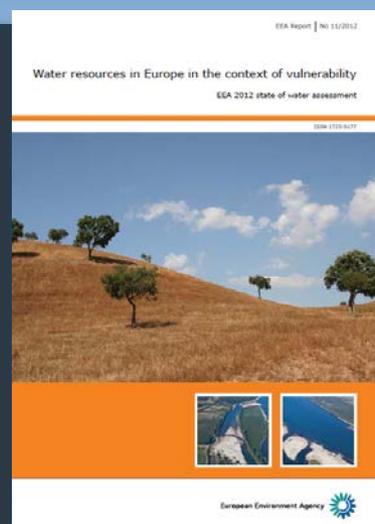
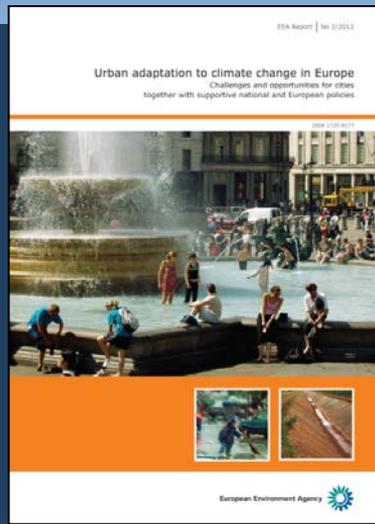
It was developed by the Commission in close cooperation with Member States and stakeholders over the past two years and has been submitted to the European Parliament and the Council.

>> [Read the strategy paper](#)

The page also includes a sidebar with a navigation menu and a "Help us improve this website" section.



EEA activities 2011-2013



CLIMATE-ADAPT
European Climate Adaptation Platform

Glossary | Contact | Sitemap | Legal notice | About

Search the website

Home | Adaptation information | EU sector policies | Countries and other areas | Tools | Links | Search the database

Adaptation support tool

New to adaptation? Use the Adaptation Support Tool

What are European countries doing?

Choose your country

Climate Change Adaptation in Europe

The European Climate Adaptation Platform (CLIMATE-ADAPT) aims to support Europe in adapting to climate change. It is an initiative of the European Commission and helps users to access and share information on:

- Expected climate change in Europe
- Current and future vulnerability of regions and sectors
- National and transnational adaptation strategies
- Adaptation case studies and potential adaptation options
- Tools that support adaptation planning

Read more

Find case studies on adaptation in Europe

Share your information

Search the database

News

- 25 April 2012: Survey on Adaptation strategies for European Cities - DG Climate Action invites cities to participate in a survey on their

Events

- 24 April 2012: First Baltadapt Policy Forum, Berlin, Germany
- 12-15 May 2012: ICLEI, Resilient Cities 2012, 3rd Global Forum on Urban

EU sector policies

- Agriculture & Forestry
- Water management

EU information systems

- WISE: Water
- Biodiversity



Climate change, impacts and vulnerability in Europe (EEA indicator based report, Nov 2012)

Content:

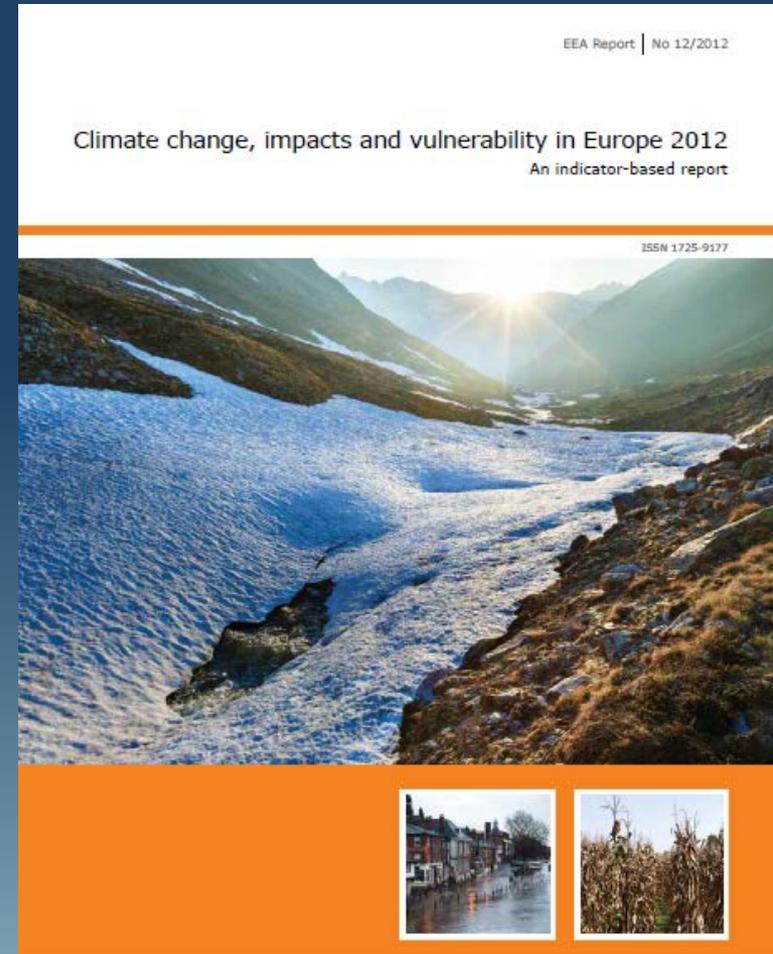
- climate change and impacts
- sectors and regions most at risk
- main sources of uncertainty
- monitoring needs

Preparation:

- European Topic Centres, incl ETC climate change adaptation, WHO, ECDC, JRC (about 90 experts)
- Data from research projects and international databases
- External advisory group
- Expert and government review process

Next steps:

- Selected indicators on the EEA web site to be updated after publication of IPCC WGI/II reports in 2013/2014



Europe's key past and projected impacts and risks/vulnerabilities

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

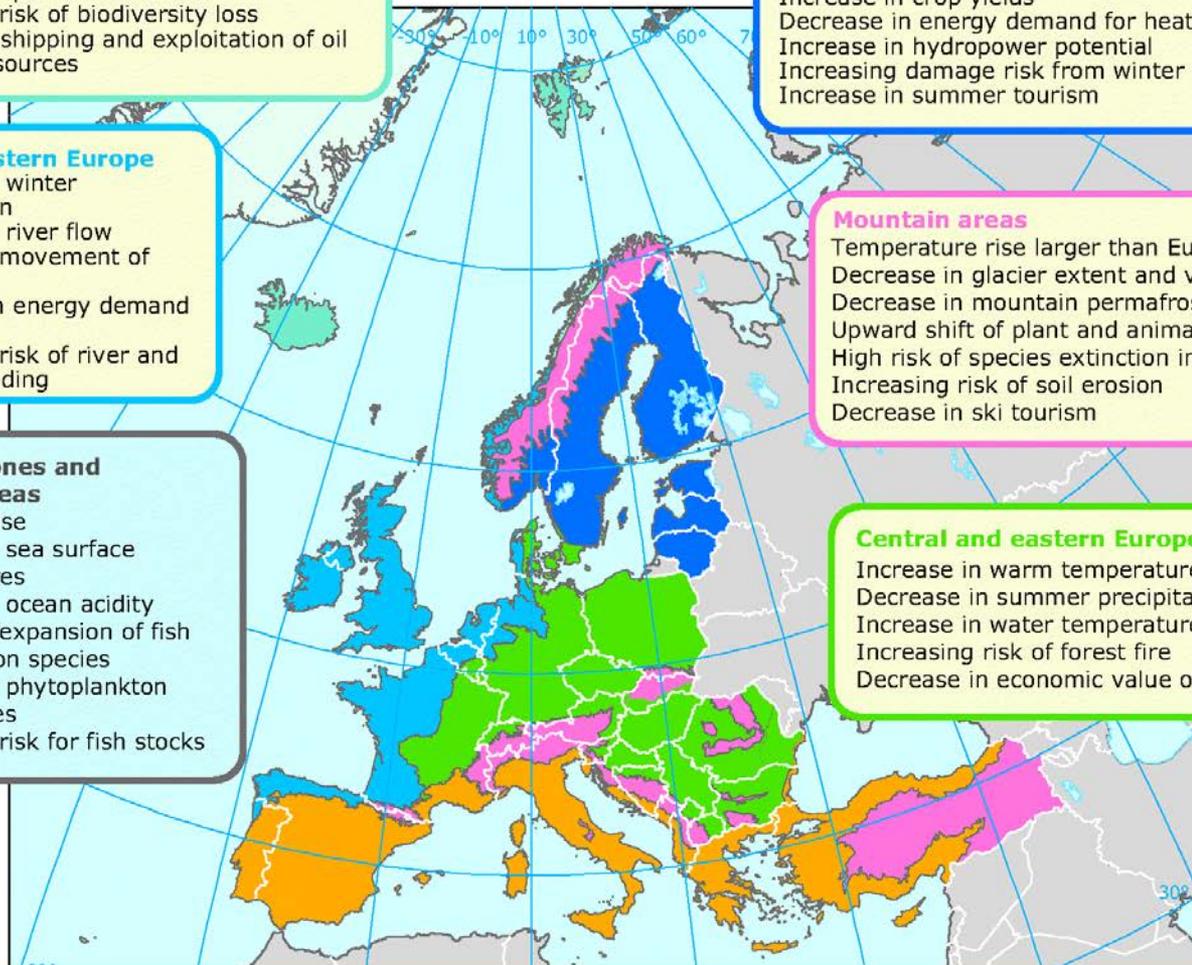
Increase in warm temperature extremes
Decrease in summer precipitation
Increase in water temperature
Increasing risk of forest fire
Decrease in economic value of forests

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



Example: forests and forestry

Climate effects	Impacts	Consequences
Increased CO ₂ concentrations, longer growing season	Increased productivity of some species, e.g. for biomass production	Increased timber supply
Reduced snowfall	Decrease in snow damage Increase in wet snow damages	
Increase in average winter temperature	Winter chilling requirements for flowering and seed germination not met, incomplete winter hardening Reduction in winter cold damage Reduction in cold-associated mortality of insect pest, deer populations Potential for range of new species	Reduced natural regeneration Serious winter tree damage Increased tree damages
Higher earlier spring temperatures	Earlier budburst and potentially increased damages by late frosts	Reduced high-quality timber supply
Decrease in spring and summer rainfall	Drought during tree growth period Threat to newly planted trees Increase in forest fires Limiting current tree species range	Reduced tree growth, serious damage to trees Tree damage; increased tree vulnerability to insect attack; increased risk of soil erosion Changes in tree composition and thus in the range of goods and services
Increased winter rainfall	Waterlogging of soils, killing of tree roots	Reduction of rooting depths Increased vulnerability to droughts and storms
Reduced soil moisture	Changes in species suitability	
Increased frequency of high or extreme temperature episodes	Damaging effects of pests	Tree damage and mortality: loss of timber quality and quantity
Changes in temperature, rainfall and frequency of extreme weather events	Loss of biodiversity	Loss of biodiversity and habitats
Increase in storm events	Wind throws	Loss of quality timber supply, of recreational areas, gaps favouring regeneration
Droughts	Serious damages to trees and stands	Reduced timber volume and reduced high-quality timber supply; higher susceptibility to pests and pathogens; higher mortality; effects on nutrient cycling, habitats and fauna
Extreme weather events	Migration of tree species/loss of native tree species Potential reduction of some of the damaging effects of pests	Loss of biodiversity and habitats Reduced tree damage and yield losses (either quantity or quality)

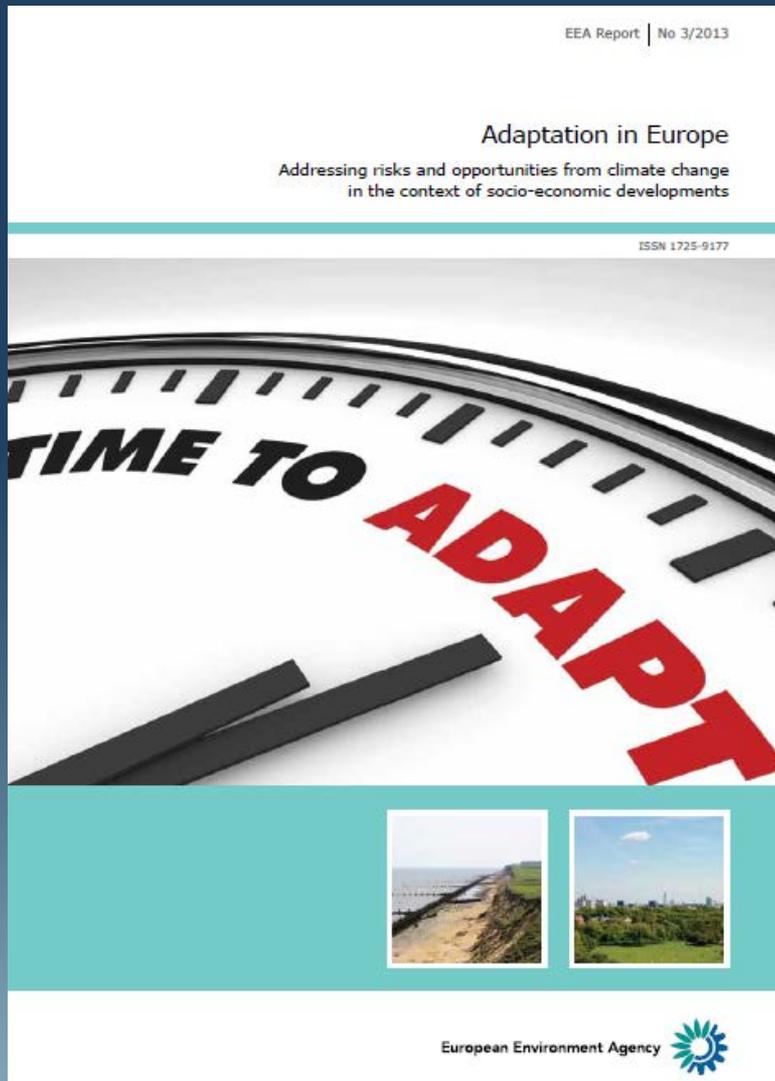


Example: forests and forestry key messages

- **Forests provide multiple goods and services**, including wood supply, carbon accumulation, ecosystems services, water purification, protection against natural hazards and recreational services.
- **Forests in Europe have been accumulating carbon (C)** at a rate of more than 100 million tonnes (Mt C) per year from 1990 to 2010. The area covered by forests and other wooded land in Europe (39 EEA countries) has increased for many decades.
- **Climate change is expected to have major impacts on forest ecosystems.** Rising atmospheric CO₂ concentration, higher temperatures and changes in precipitation are likely to have significant effects on the vegetation period, growth, health and distribution of trees as well as on forest ecosystems, and thus on the goods and services provided by forests.
- Climate change may also enhance the **frequency of favourable conditions for forest fires** extending the fire season in both time and space.
- An increase in storms, droughts and heat waves can lead to **higher rates of tree mortality**, and make forests **more susceptible to secondary damages, such as insect and fungal infestations.**



Adaptation in Europe (EEA report, 29 April 2013)



- To inform and support policymakers who are/will be formulating or implementing adaptation policy and actions ((trans-)national, regional, local authorities, private stakeholders)
- To demonstrate that adaptation actions are already being taken across Europe
- To support the implementation of the 2013 EU Adaptation Strategy



Adaptation is already happening...



'Sand motor' beach replenishment, Ter Heijde, Netherlands



Campaign to prevent insect-borne diseases, Emilia-Romagna, Italy



New grape variety research, Spain



Restoration of the Danube, Kalimok marsh, Bulgaria



Peatland restoration, Lough Boora, Ireland

Cantonal Insurance Monopolies, Switzerland



European Environment Agency



Examples of some adaptation in forest management

- Better resilience against heavy storm events — Germany
- Conversion of tree composition at local level — Poland
- Increasing drought resistance of species — Spain
- New silvicultural practices — France
- Strategies of forestry companies — Sweden
- Adaptive silvicultural practices — Austria



Forest regeneration with conversion to broadleaved species, Slovakia

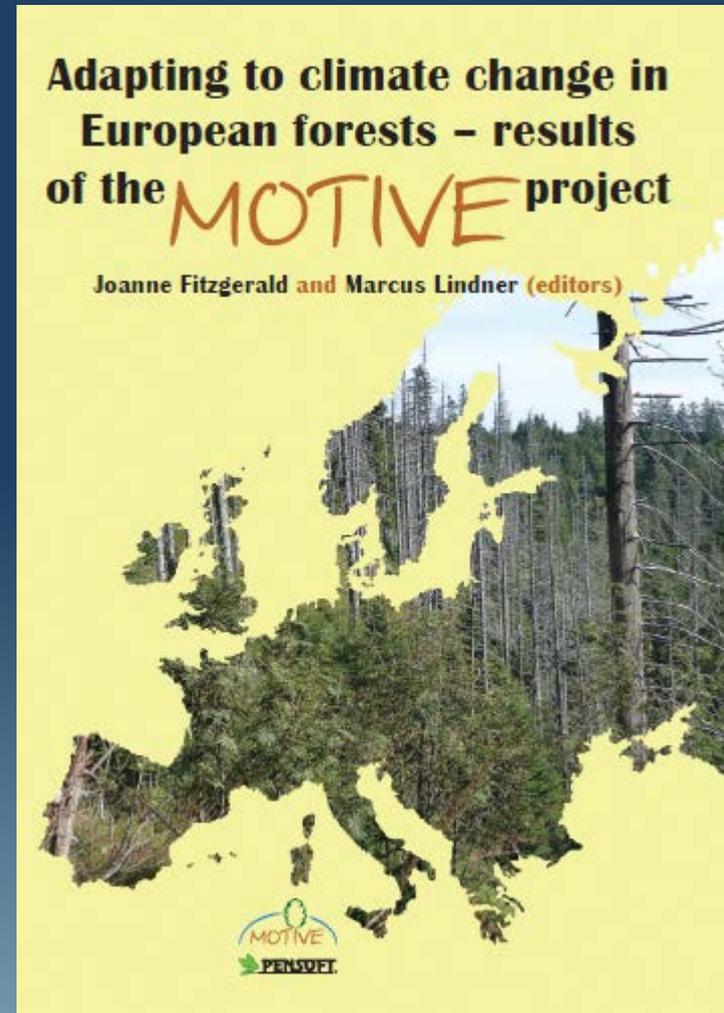


Mediterranean forest with mixed domestic species, France



Example: research project

- The EU funded FP7 project '**MOTIVE**' (MOdels for AdapTIVE forest Management) investigated **adaptive management strategies** that address climate and land use change
- It also examined the **impacts** of these changes on a broad range of **forest goods and services**
- It focused on **regional case studies**, implemented in a participatory process with local stakeholders.

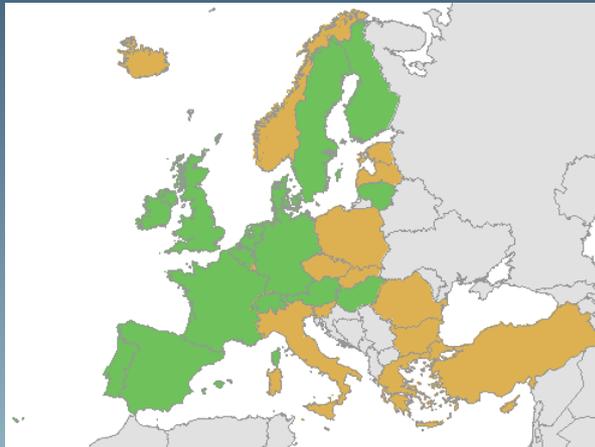


Source: MOTIVE project, Joanne Fitzgerald and Marcus Lindner (editors), <http://motive-project.net/>



Key messages

- **16 of the 33 EEA member countries have national adaptation strategies**, and some have started to prepare/implement action plans.
- Some **transnational regions** (e.g. the Danube, the Baltic, the Alps and the Pyrenees) and **cities** have developed or are developing adaptation strategies.
- Examples are available of actions taken, using different measures (**'grey' measures** using technological and engineering approaches, **'green' ecosystem-based approaches** using nature, and **'soft' measures** such as policies to change governance approaches)
- Challenges include the need for **coherent, flexible and participatory approaches**



European Climate Adaptation Platform Climate-ADAPT

- Supports governmental decision-makers developing/implementing climate change adaptation strategies, policies and actions
- Launched March 2012 (DG CLIMA, EEA)
- EEA maintains, with Commission, and supported by ETC CCA

The screenshot shows the CLIMATE-ADAPT website interface. At the top, there is a navigation bar with the logo, the text 'CLIMATE-ADAPT European Climate Adaptation Platform', and links for 'Sign In', 'Glossary', 'Contact', 'Sitemap', 'Legal notice', and 'About'. A search bar is also present. Below the navigation bar, there is a main content area with several sections:

- Home** | **Adaptation information** | **EU sector policies** | **Countries and other areas** | **Tools** | **Links** | **Search the database**
- Climate Change Adaptation in Europe**: A section with a circular diagram labeled 'Adaptation support tool' and a list of bullet points: 'Expected climate change in Europe', 'Current and future vulnerability of regions and sectors', 'National and transnational adaptation strategies', 'Adaptation case studies and potential adaptation options', and 'Tools that support adaptation planning'. A 'Read more' link is provided.
- What are European countries doing?**: A section with a map of Europe and a 'Choose your country' dropdown menu.
- Search the database**: A search bar with a magnifying glass icon.
- Share your information**: A section with a circular diagram and a 'Share your information' button.
- News**: A section with a globe image and three news items: 'Apr 2013 EU adaptation strategy launched - advancing adaptation action', 'Apr 2013 EU adaptation strategy: stakeholder event, 29 April', and 'Feb 2013 LIFE+ 2013 call for proposals'.
- Events**: A section with a photo of a conference and three event items: '17-19 April 2013, 7th European Conference on Sustainable Cities & Towns, Geneva, Switzerland', '29 April 2013, Launch event for EU strategy on adaptation to climate change, Brussels, Belgium', and '31 May - 2 June 2013, Resilient Cities 2013, Bonn Germany'.
- EU sector policies**: A section with two sub-sections: 'Agriculture & Forestry' and 'Water management', each with a 'Read more' link and a 'View all sectors' link.
- EU information systems**: A section with two sub-sections: 'WISE Water' and 'Biodiversity', each with a logo and a 'Read more' link.

<http://climate-adapt.eea.europa.eu>





Climate Change Adaptation in Europe

Key tools:

[Adaptation support tool](#)

[Overview of countries activities](#)

[Case study search tool](#)

[Database](#)

[Share information](#)



Find case studies on adaptation in Europe



What are European countries doing?

Choose your country GO



Share your information

News



- » Apr 2013 EU adaptation strategy launched - advancing adaptation action
- » Apr 2013 EU adaptation strategy: stakeholder event, 29 April
- » Feb 2013 LIFE+ 2013 call for proposals

Events



- » 17-19 April 2013, 7th European Conference on Sustainable Cities & Towns, Geneva, Switzerland
- » 29 April 2013, Launch event for EU strategy on adaptation to climate change, Brussels, Belgium
- » 31 May - 2 June 2013, Resilient

EU sector policies



Agriculture & Forestry

» [Read more](#)



Water management

» [Read more](#)

» [View all sectors](#)

EU information systems



Water



Biodiversity

EU sectoral policies

- Home
 - Adaptation information
 - EU sector policies**
 - Countries, regions and cities
 - Tools
 - Links
 - Search the database
- General**
 - Agriculture and forestry
 - Biodiversity
 - Coastal areas
 - Disaster risk reduction
 - Financial
 - Health
 - Infrastructure
 - Marine and fisheries
 - Water management

EU Adaptation Policy

In April 2013 the European Commission adopted the [EU strategy on adaptation to climate change](#) which sets out a framework and mechanisms for taking the EU's preparedness for current and future climate impacts to a new level. The EU finances adaptation to climate change in Europe through a [wide range of instruments](#).

Climate policy mainstreaming is the involvement of actors, whose main tasks are not directly concerned with climate change, working towards the goals of [mitigation](#), or [adaptation](#). Adaptation means anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause. Early action will save damage costs later on, so adaptation strategies are needed at all levels of administration, from local to international.

Mainstreaming climate change adaptation in EU policies is one of the pillars of the European Commission's 2009 [White Paper "Adapting to climate change: Towards a European framework for action"](#). In the [Europe 2020 strategy for smart, sustainable and inclusive growth](#), the following statement is made on combating climate change: 'We must also strengthen our economies' [resilience to climate risks](#), and our capacity for disaster prevention and response'.

EU policies in which such mainstreaming is ongoing or explored are:



Agriculture and Forestry

The European Commission's EU strategy on adaptation to climate change...»

[Read more](#)



Biodiversity

Climate change is expected to have a substantial impact on biodiversity, the functioning of ecosystems...»

[Read more](#)



Coastal areas

Sea level rise can cause flooding, coastal erosion and the loss of low-lying...»

[Read more](#)



Disaster risk reduction

Over the last few years, Europe has experienced severe forest fires, floods, and droughts...»

[Read more](#)



Financial



Health



Information on countries adaptation strategies



CLIMATE-ADAPT

European Climate Adaptation Platform

[Sign in](#) | [Glossary](#) | [Contact](#) | [Sitemap](#) | [Legal notice](#) | [About](#)

Search the website

[Home](#) | [Adaptation information](#) | [EU sector policies](#) | [Countries, regions and cities](#) | [Tools](#) | [Links](#) | [Search the database](#)

[General](#) | [Countries](#) | [Transnational regions](#) | [Cities and towns](#)



Choose a country

France

[Legal framework](#)

[Assessments](#)

[Priority sectors](#)

[Local actions](#)

[Summary](#)

[Contact](#)

Responsibility for climate change adaptation is split between national, regional and local levels.

- The creation of a National Observatory for the Effects of Global Warming ([ONERC](#)) in 2001, tasked specifically with adaptation to climate change, followed by the adoption of the [National Adaptation Strategy in 2006](#), marked the beginning of French government activity in the adaptation field;
- Programme law 2009-967 of 3 August 2009, relating to the implementation of the Grenelle Environment Forum, makes provision in Article 42 for "the preparation of a National Adaptation Plan for a variety of areas of activity by 2011". The first [National Adaptation Plan](#) was published on 20 July 2011 and aims to present concrete measures designed to prepare for and exploit new climatic conditions in France. The Plan covers a five-year period (2011-2015). 20 key fields are identified for action. More than 90 % of actions have started and some like [Drias les futur du climat](#) are completed.
- Regional adaptation guidelines are defined in Regional Climate, Air and Energy Schemes (SRCAE) and local adaptation actions are designed within Territorial Climate-Energy Plans ([PCET](#)), under the provisions of Law 2010-788 of 12 July 2010.

Some French overseas communities have a specific competency regarding environmental policy (e.g. French Polynesia, New Caledonia). Thus adaptation policy falls under their local decision making process. French Polynesia is currently developing its strategic climate plan with specific provisions for adaptation issues.

In November 2009, France submitted its [fifth national communication](#) to the UNFCCC, with a significant part dedicated to adaptation issues and policies.

Database search



CLIMATE-ADAPT database
The database contains quality checked information and is annotated by climate adaptation experts with keywords.

Find data that has...

Any of these words: All of these words:

Type of data

All types A selection of types

Extended search

- Adaptation sectors
- Climate impacts
- Adaptation elements
- Countries

Clear

Search

Search results: 1305

- ▶ Publications and reports (357)
- ▶ Information portals (135)
- ▶ Guidance (67)
- ▶ Tools (30)
- ▶ Maps, graphs and datasets (100)
- ▶ Indicators (42)
- ▶ Research and knowledge projects (367)
- ▶ Adaptation options (65)
- ▶ Case studies (66)
- ▶ Organisations (76)



Some statistics on Climate-ADAPT

- About 15 000 unique visitors per months on average
- 5th most visited EEA domain after HomePage, EUNIS (nature information), Glossary and Natura2000 (protected areas)
- Pages most visited are:
 - Country profiles
 - Adaptation support tool
- Visitors mostly from Denmark, Italy, Germany, UK, Netherlands, France, Belgium, US, Spain and Austria
- Visitors access through:
 - Direct link (25%)
 - Google (25%)
 - EEA web site (20%)



Climate-ADAPT next steps

- Dissemination (Trainings, presentations, brochure, videos); Newsletter
- Update national and transnational information (e.g. Baltic Sea Region)
- Enhance city information
- Case studies improvement and enhancement
- Include outputs from key EU research, DG CLIMA, Interreg, LIFE+ projects on adaptation
- Include information on EU funding options
- Extend to include other countries (e.g. West Balkan)
- Links/interface to (future) Copernicus climate change service



Conclusions

- **Indicators** are available but **further monitoring and national and EU research** are needed. **Copernicus** projects and the **planned EU climate change service** and national services are **essential**
- **Mainstreaming** of climate change adaptation **in EU policies** is taking place; the **European Commission** adopted an **EU adaptation strategy in April 2013** with proposals for further action
- Many EEA member **countries** have developed impacts, vulnerability and adaptation **assessments** and several countries and cities have **strategies** in place (and **some also action plans**); also many **transnational** actions have taken place or are planned (e.g. Baltic Sea Region)
- The **European Climate Adaptation Platform and transnational, national and city level adaptation platforms** will support climate change adaptation at various governance levels



Thank you for your attention

<http://www.eea.europa.eu/themes/climate>
<http://climate-adapt.eea.europa.eu>

