



# Adaptation in Portuguese cities: some remarks and examples

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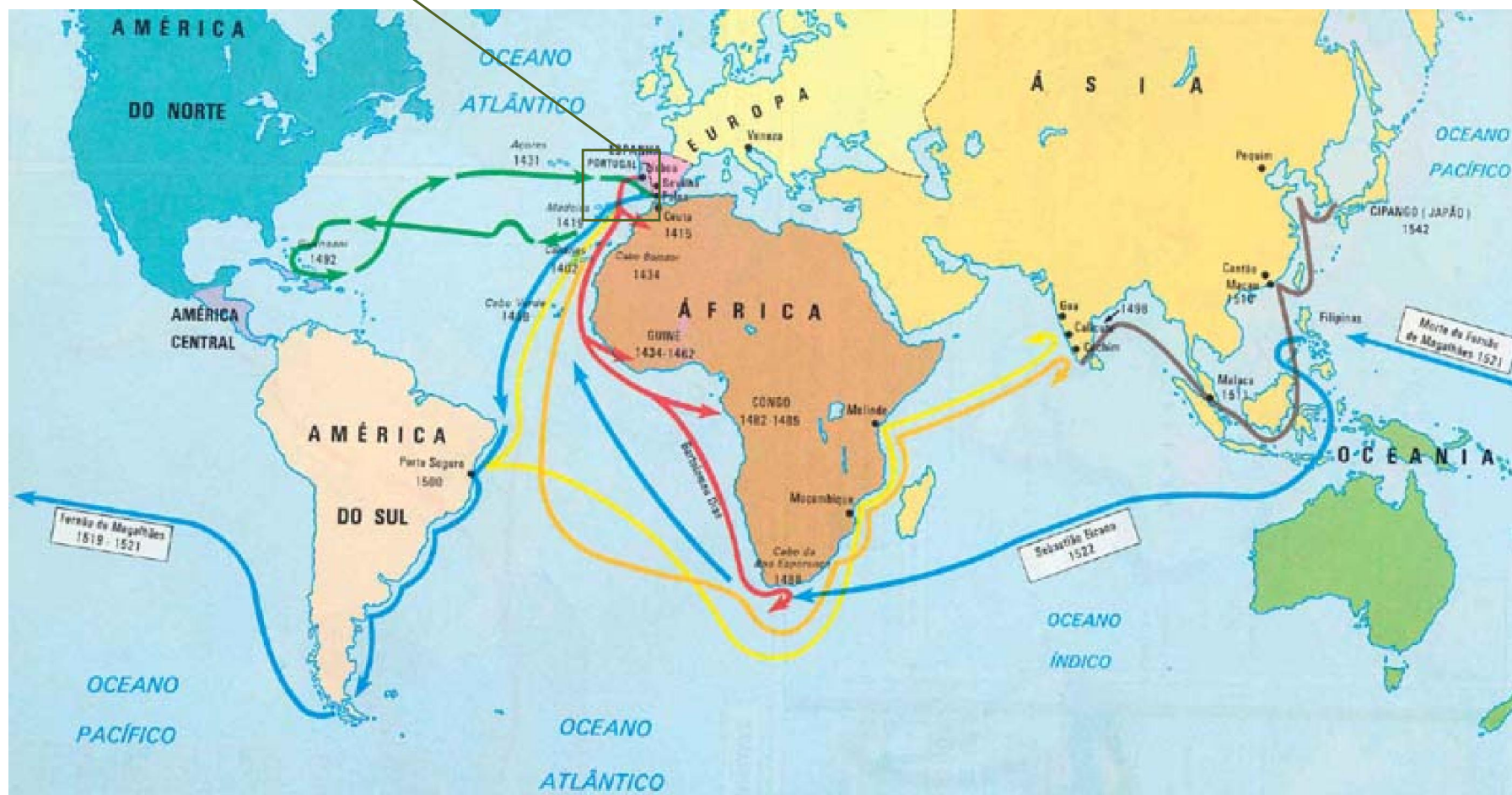
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# Portugal





# Portugal: a brief description

- § Total area: 92 090 km<sup>2</sup> (35 645 sq mi)
- § Coastline: 943 km (mainland) + 917 km (islands)
- § Population: 10.64 million
- § 61% urban population
- § Population density: 115 inhabitants/ km<sup>2</sup>
  
- § Life expectancy at birth= 78.7 years
- § Mean years of schooling= 8 years;  
School life expectancy= 16 years
- § GDP pcapita, 2009 = 21 370 USD (PPP)
- § HDI= 0.889 (very high human development),  
41<sup>st</sup> among 187 countries and territories





# Portugal: a brief description (cont.)

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- § One of the oldest countries in Europe (sovereign nation since 1143)
- § Republic (since 1910), with democratic parliamentary government (democracy since 1974)
- § Member of the United Nations (1955), and member of the European Union (EU) since 1986





# Portugal: a brief description (cont.)

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As part of the EU, many of the economic and political **decisions are coordinated** among the 27 Members States, through a system of supranational independent institutions and intergovernmental negotiated decisions.



# Climate change Adaptation in Europe

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§ Climate change mitigation and adaptation are priorities in European policy agenda

§ Main expected impacts of climate change in Europe include:

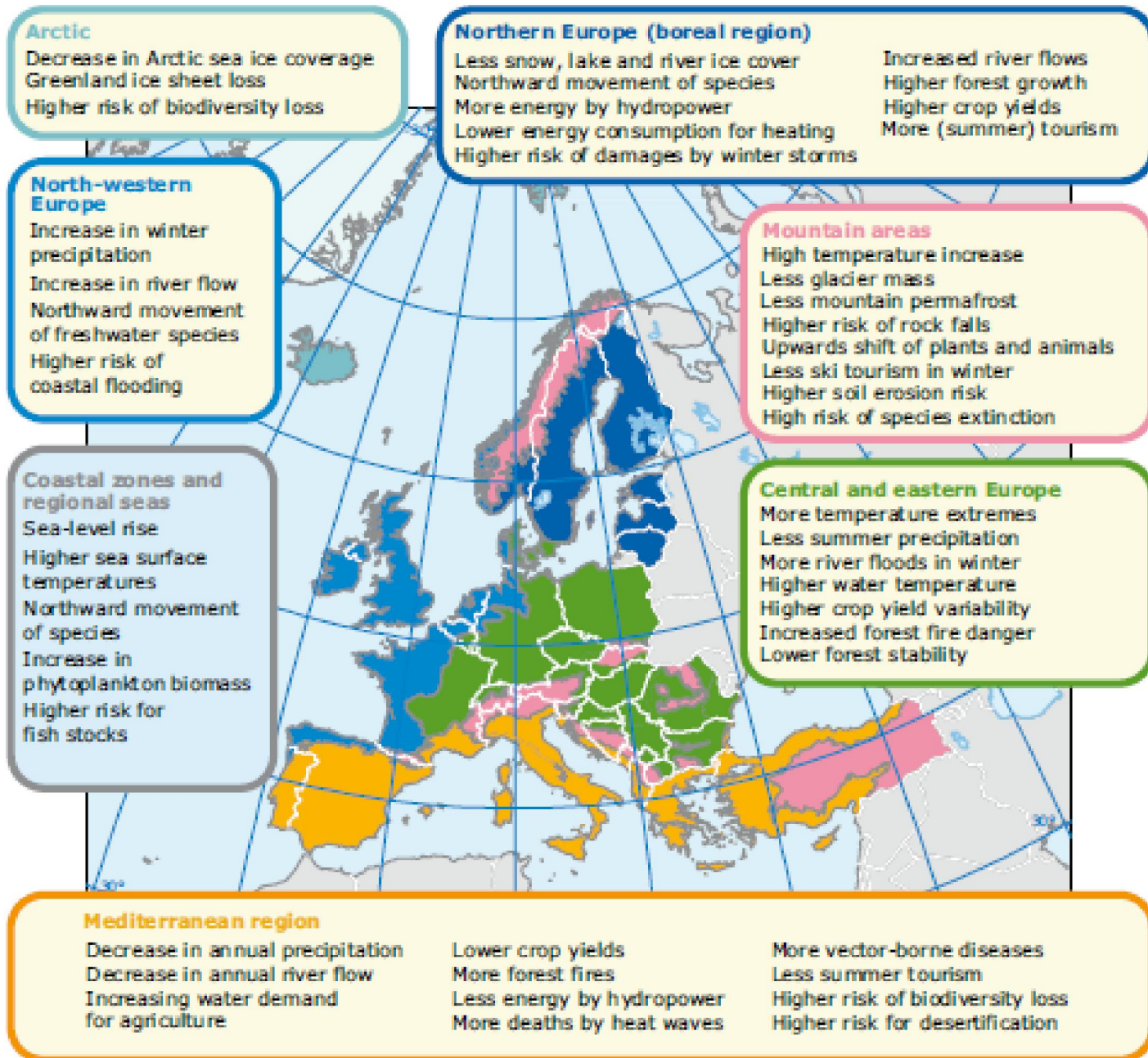
increased risk of coastal and river floods, droughts,

loss of biodiversity, threats to human health,

and damage to economic sectors (e.g., energy, forestry, agriculture, tourism)



# Projected impacts in Europe



Source: SOER, 2010



# Climate change Adaptation in Europe



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## Adaptation

- § In April 2009, the European Commission presented the *White Paper on Adaptation*- a policy paper with the **framework** for adaptation **measures** and **policies** to reduce the European Union's vulnerability to the impacts of climate change, emphasizing the importance of **knowledge** and **information** sharing....
- ... complementing technology, ecosystem-based, and behaviour/management/policy adaptation measures, at the regional, national and local levels

# Climate change in Portugal



- § Mild climate, with Atlantic influence in the North, and Continental and Mediterranean in the South
- § Average daytime max. temperature:  
12°C (Winter, Dec-Feb), 22°C (Spring, March-May; Autumn, Sept-Nov),  
25°C (Summer, June-Aug) but can go up to 40°C



Climate change is expected to modify the timing of seasons: shortening the growing season (Spring), prolonging drought periods, which contributes to soil degradation and increased risk of desertification especially in the South

# Climate change in Portugal (cont.)



§ Portugal has 10 river basins, of which 4 (Minho, Douro, Tejo and Guadiana) are internationally shared with Spain



Water management, in cooperation context, is the oldest and most important area of environmental public policy in Portugal

§ In Portugal, the current *Water Law*(2005) is the national correspondence to the European *Water Framework Directive*(2000) - the main legal framework to protect and restore clean water and ensure its long-term, sustainable use

# Adaptation in Portugal: examples



§ Prepare for intense rainy events and the risk of floods in river basin areas



European *Floods Directive* (2007) - legal framework for the assessment and management of flood risks

§ In Portugal, the *Instituto da Água* (INAG, water institute) monitors the levels and the quality of water ...

... through modern radar for meteorological observations



*Expl:* Municipality of Loulé (Algarve) radar that captures data on intensity of rain within 200km distance



# Adaptation in Portugal: examples (cont.1)

§ INAG also implementing projects to prevent floods, especially near by urban areas, controlling flows



Torres Vedras



Odivelas



Torres Vedras



Palmela

# Adaptation in Portugal: examples (cont.2)



§ Urban **green infrastructures** can also make cities more resilient to climate pressures



Under the management of local municipalities, there is now a total of 3 900 Waste Water Treatment Plants (ETARs) treating the water from industries and homes of 76% of the Portuguese population, and reducing the pollutants before discharges

Municipalities currently promote the construction of buildings with infrastructures to re-use water from rain for non-drinkable usages (e.g., gardening, washing car)



# Other Adaptation examples



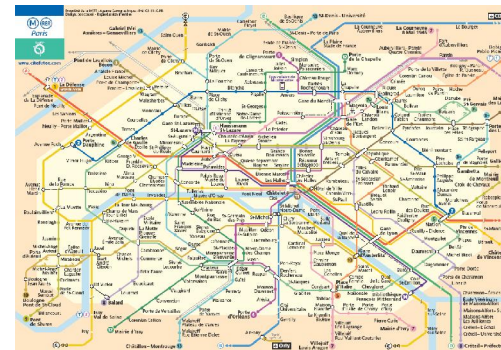
§ **Mobility**, vital in a city, is an area where much can be done in terms of reducing GHG, air pollution, noise, and land-take for roads and parking areas

European cities favour the use of collective public transports, aiming for an even greater attractive frequency, comfort, easy access, reliability of services, and intermodal integration

Metro,  
Oporto



Metro,  
Paris



Barcelona Bici



Amsterdam

Several European cities are also encouraging cycling as a mean of regular transport, building dedicated paths in roads

# Concluding remarks

§ Cities are ecosystems, open and dynamic; they develop and adapt, through human action and in interaction with other ecosystems;

§ Rethinking urban design, infrastructures, and transports;  
having better information (and sharing them);  
and improving urban planning through  
coordinated efforts at local, national and regional levels...

... seems a necessary way to turn urban ecosystems at the forefront of  
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## Thank you!

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- European Environment Agency, 2010, " *The European environment – state and outlook 2010* "
- European Commission, Directorate-General for the Environment: <http://ec.europa.eu/dgs/environment>