

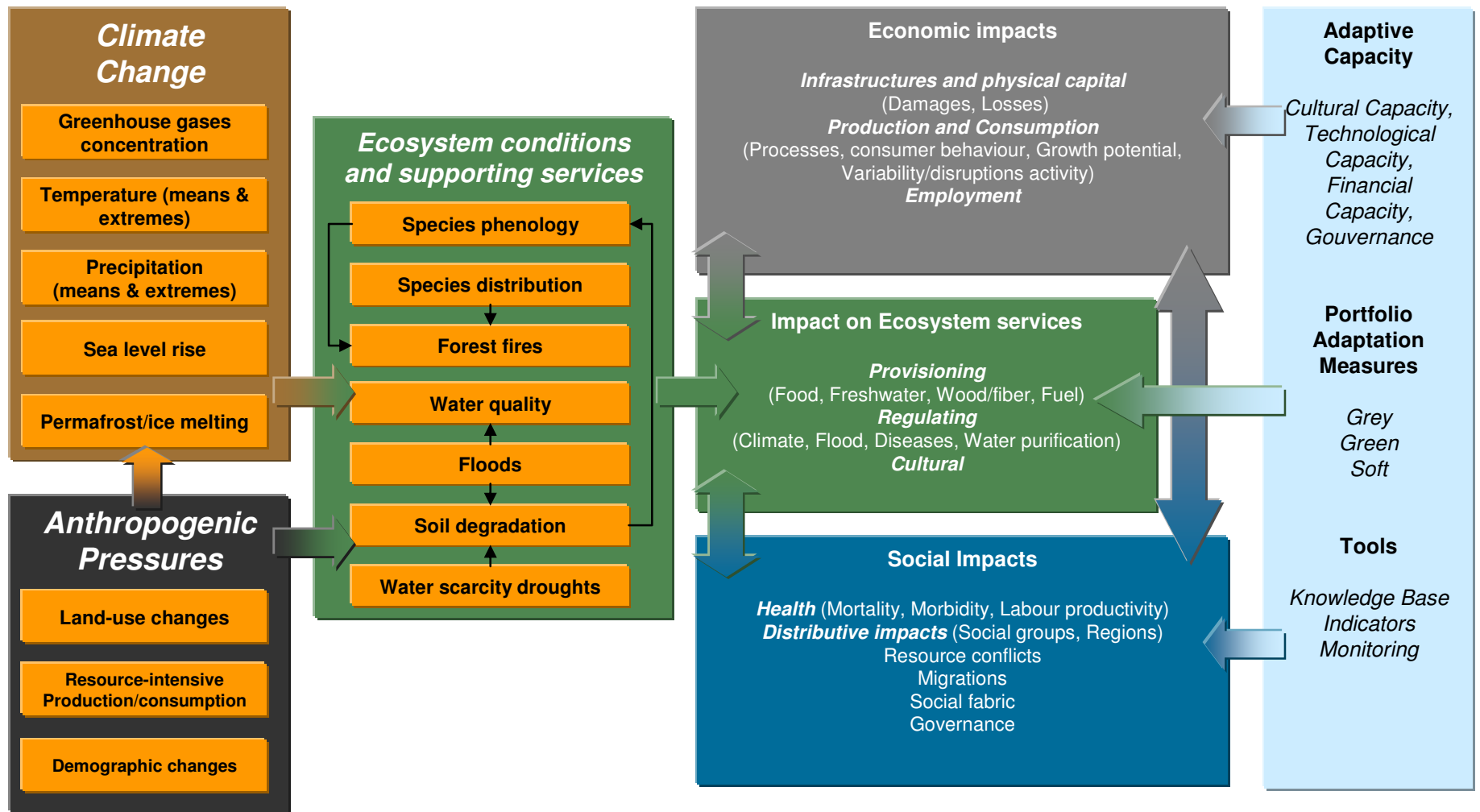
EU projects in the Carpathian region: CARPATCLIM and CarpathCC

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Environmental pathway of vulnerability and adaptation

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Preparatory action — Climate of the Carpathian basin

- Objective approved by the European Parliament:
 - to investigate the detailed weather-related and spatial structure of the Carpathians Region with integrated or at least comparable methods.
 - The basic results will be a contribution to regional climate variability and change studies, and applied climatology.
- 2009 budget allocation:
 - Service contract (lead by Hungarian Meteorological service)
 - improve the basis of climate data in the Carpathian Region for applied regional climatological studies
 - Started in December 2010
 - JRC
 - integration of results into the European Drought Observatory

Preparatory action — Climate of the Carpathian basin

- 2010 allocation: as a follow-up of the Adaptation White Paper, the European Commission proposed to focus work on:
 - Analysis of the vulnerability of water and ecosystems of the region to climate change impacts and other man-made pressures
 - Identifying potential adaptation measures, focusing on adaptive water management and ecosystem-based approaches.
- Benefits
 - National or Regional adaptation strategies in the Carpathian Region
 - Danube Climate Adaptation Strategy
 - Contribution to the forthcoming EU Information System (Clearinghouse) on Climate Change Vulnerability and Adaptation

Preparatory action — Climate of the Carpathian basin

- 2010 budget allocation:
 - Service contract « CARPIVIA » (lead by Alterra)
 - integrated assessment of vulnerability of environmental resources and ecosystem-based adaptation measures.
 - Started in December 2010
 - Framework contract « CarpathCC » (lead by Vituki)
 - in-depth assessments of vulnerability of environmental resources and ecosystem-based adaptation measures:
 - (1) In-depth study on the key climate change threats and impacts on water resources
 - (2) In-depth study on the impacts of climate change threats on ecosystems
 - (3) In-depth study on the impact of climate change on ecosystem based production systems
 - (4) In-depth study on adaptation measures
 - (5) Supporting stakeholder interaction
 - (6) Integral vulnerability assessments in focal areas
 - Started in January 2012

Background of the CARPATCLIM project

- Hungarian initiative in the Environmental Committee at the European Parliament in 2008
- Accepted by the Economical Committee and the Plenary in 2008
- Preparation of the tender by DG Environment and JRC Ispra in 2009
- Call in June 2010

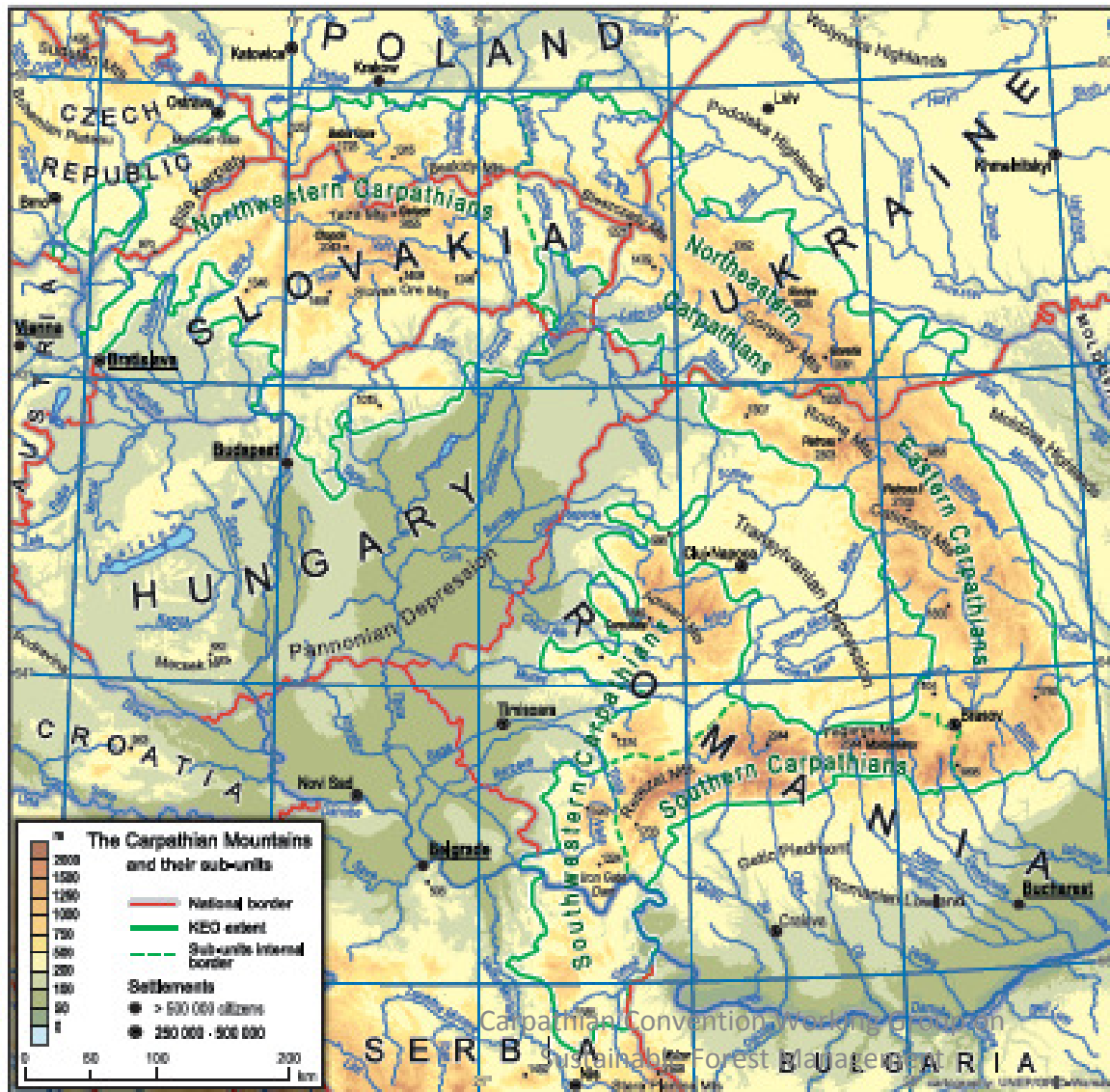
Countries and participants

- Bulgaria, Czech Republic, Croatia, Hungary, Moldova, Poland, Romania, Serbia, Slovakia, and Ukraine
- (Hydro)meteorological institutes and services of Czech Republic, Slovakia, Austria, Poland, Ukraine, Serbia, Hungary, and the National Research and Development Institute of Environmental Protection of Romania and the Szent Istvan University from Hungary. The Croatian Hydrometeorological Service takes part in the project as well. Slovenia supports the initiative

Territory

- For the production of the digital climate atlas, the resulting climatological grids should cover the area between latitudes 50°N and 44°N , and longitudes 17°E and 27°E , approximately.

Map



Set of meteorological variables in daily temporal resolution to be provided (1)

- Daily average temperature
- Daily minimum temperature
- Daily maximum temperature
- Daily precipitation
- Wind direction
- Wind speed
- Sunshine duration
- Cloud cover
- Global radiation
- Relative humidity
- Surface vapour pressure
- Surface air pressure
- Snow depth

Minimum set of variables and indicators to be provided for the Digital Climate Atlas of the Carpathian Region

Number of frost days, summer days, hot days

PAI (PaDI)

SPI3

Reconnaissance Drought Index

Palmer Drought Severity Index

Percentage of days without defrost (ice days)

Percentage of extremely hot days, severe cold days

Growing season length

Percentage of wet days, wet days above 20 mm/days

Greatest 1-day and 5-day total rainfall

Aridity index

Moisture index

Ellenberg index

Structure of CarpathCC project

- (1) In-depth study on the key climate change threats and impacts on water resources
- (2) In-depth study on the impacts of climate change threats on ecosystems
- (3) In-depth study on the impact of climate change on ecosystem based production systems
- (4) In-depth study on adaptation measures
- (5) Supporting stakeholder interaction
- (6) Integral vulnerability assessments in focal areas

In-depth study on the key climate change threats and impacts on water resources

- Produce maps for projected floods, droughts and changes snow cover
- Assess projected seasonal shift in water balance and impacts on soils
- Assess the potential impacts of climate change on the implementation of the water framework directive and flood directive
- Assess the risk of landslides in relation to changing precipitation patterns and flash floods
- Impact of changes in ecosystems and adaptation measures on water resources

In-depth study on the impacts of climate change threats on ecosystems

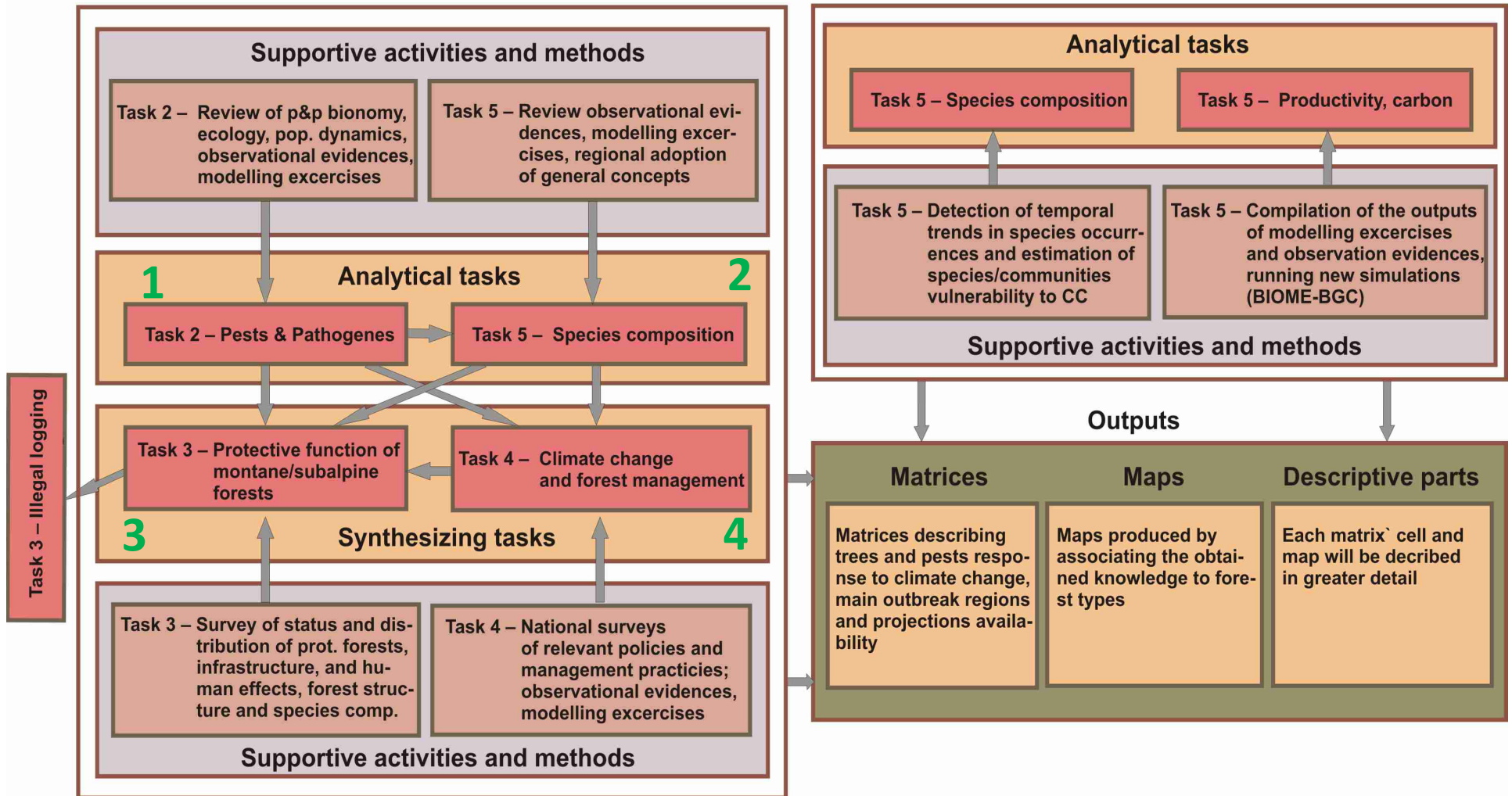
- Assessing the effect of pests and pathogens on the Carpathian forests; climate change-induced increase in virulence; change in distributional and outbreak ranges, and change in populations dynamics of both resident and newly-emerging forest pests and pathogens will be addressed;
- Assessing the effect of climate change on protective function of montane and subalpine forests in the Carpathians;
- Evaluating the effect of management practices on forest vulnerability to climate change, including expected adaptation potential of forest management;
- Evaluating the anticipated changes in species composition of forests, wetlands and grasslands, including climate change effect on grasslands productivity

SR2 – Work Plan & Map

T. Hlasny

Forests

Grasslands & wetlands



Task 2

- Report on presently occurring pests and pathogens in the Carpathians, including recent observations of climate change-induced alteration of pests outbreak ranges, population dynamics, predator-prey and host-parasitoids relations, distribution and virulence of pathogens;
- Matrices containing the list of resident and newly emerging pests and pathogens for representative regions of the Carpathians (Fig. SR2-2). Expected climate triggers, expected responses (positive/negative) and magnitude of the response (using qualitative indicators), and present and expected ecological importance of given pest or pathogen will be filled in the matrix;
- Map of exposed main forest classes with indications of their vulnerability to key pests and pathogens; expected climate change-induced alterations of present disturbance regime will be indicated as well;
- Inventory of options to increase forest-stand natural resilience against pests and pathogens, including silvicultural measures to mitigate the mortality of infested trees.

Task 3

- Report on the effect of changes in forest cover (deforestation due to various disturbances, forest decline, decrease of stand density and canopy closure, etc.) on protective function of montane and subalpine forests;

Task 4

- Report on forest management practices applied in the Carpathians and their potential to adapt the forests to the forthcoming climate change or on their detrimental effect, respectively;
- Report on the extent in which the concept of continuous-cover forestry, adaptive changes in species composition, and other adaptive silviculture techniques are applied in particular regions of the Carpathians; as well as extent in which detrimental processes such as clear-cuts or logging related soil compaction and rutting occur;
- Report on recent trends in illegal logging, felling of losses and their expected impacts on the environment

Task 5

- Report on expected climate change-induced shift of main forest tree species, description of recent observational evidences and compilation of the outputs of various modelling exercises of species shifts;
- Report on recent evidences of change in species composition, structure and distribution of grassland communities in the Carpathians;
- Report on grassland species and communities, which were found to be most vulnerable to climate change-induced threats; including expected changes in species composition, and climate change effect on grasslands productivity;
- Report on present status of wetlands in the Carpathians; identification of main climate change and landscape management-related threats; survey of the most vulnerable wetlands; map of distribution of wetlands in the Carpathians.

In-depth study on the impact of climate change on ecosystem based production systems

- Positive and negative climate impacts on ecosystem services with specific reference to multifunctional landscapes and grasslands
- Assessment of the vulnerability of the tourism sector

In-depth study on adaptation measures

- Ex post evaluation of adaptation measures
- Supporting costs and benefits studies
- Ecological networks and ecosystem fragmentation
- Assessing and tailoring adaptation measures for the Carpathian region
- Agri-environmental schemes and other farmer support

Supporting stakeholder interaction

- series of stakeholder workshops will be organised and managed using knowledge-based facilitation techniques in order to generate: a) a number of action scenarios in relation to the impacts of climate change, based on key impacts and assessments of vulnerability; b) generate a number of adaptation options in relation to these scenarios; c) evaluate the costs and benefits of the options along with their feasibility; and d) identify preferred options and adaptation pathways

Integral vulnerability assessments in focal areas

- Tatra mountain, including Zakopane
- Rodnei and Maramures
- Tarnava Mare area
- Irongate national park and foothills
- Bükk mountains

Acknowledgement

- Author thanks to European Commission, Joint Research Centre, Institute for Environment and Sustainability, Ispra, Italy for CARPATCLIM Contract Notice OJEU 2010/S 110-166082 dated 9 June 2010 and CarpathCC, which is supported by the EU DG ENV Contract no ENV.D.1/FRA/2011/0006

Thank you for your attention!