



COST ACTION FP 0703

**Echoes: Expected Climate Change
and Options for European Silviculture**

Country Report: Major points

BULGARIA

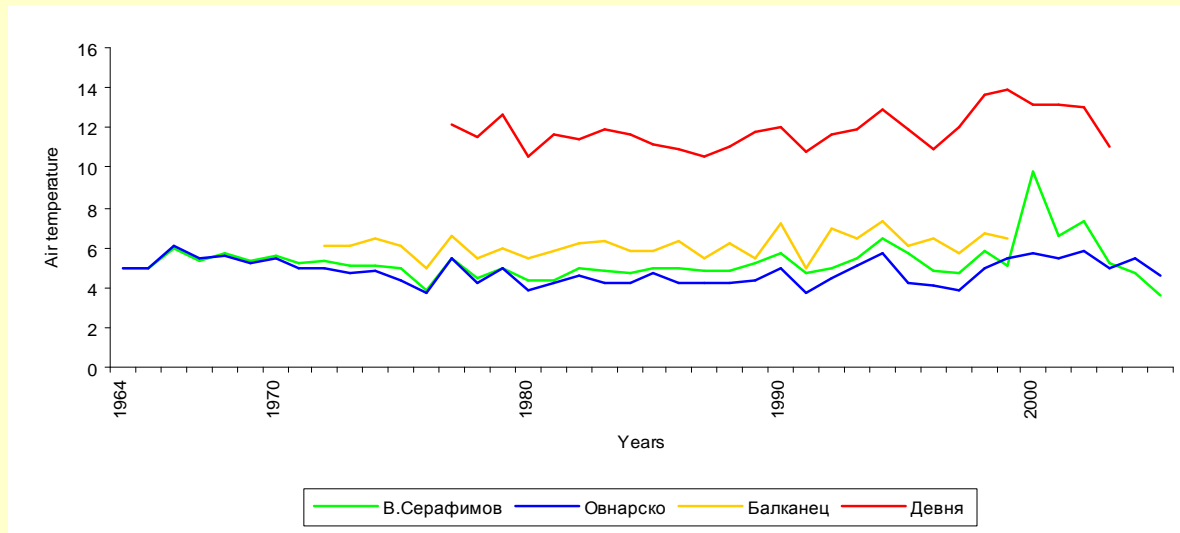
22-24 January 2009, Florence - Italy

- *Alexander Alexandrov, Forest Research Institute, Sofia, Head of Department of Forest Genetics, Physiology and Plantations, forestin@bas.bg*
- *Georgi Kostov, University of Forestry, Sofia, Head of Department of Silviculture, doc_georgi_kostov@abv.bg*
- *Tzvetan Zlatanov, Forest Research Institute, Sofia, tmzlatanov@gmail.com*

- Country area: 111 thousand square km.
- Forest fund: 37% of the country's territory. During the past 40 years, the Bulgarian forest fund increased from 3.5 mill ha to 4.1 mill ha and the growing stock increased from 247 mill m³ to 600 mill m³.
- Forested area: 3.7 mill ha (2007).

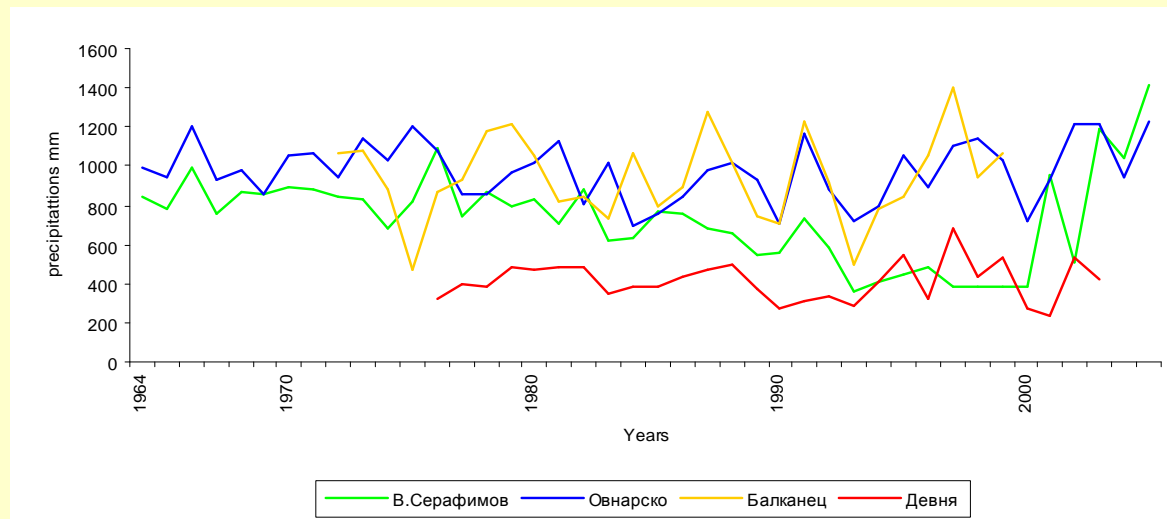


Air temperature in representative forest ecosystems in the period 1964–2005



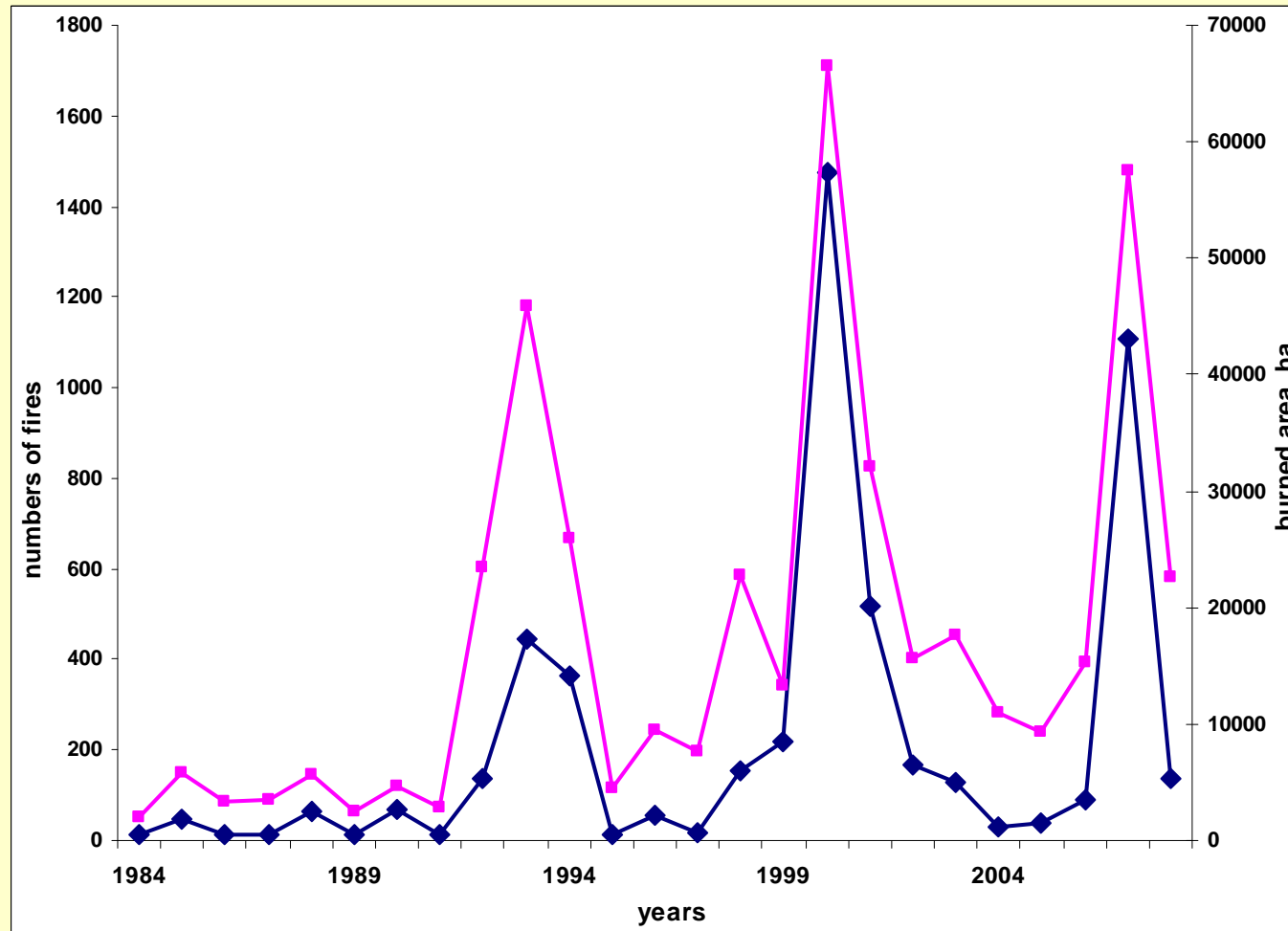
According to data from the long-term monitoring on representative forest ecosystems dominated by Scots pine (green line, **Southern Rila**), spruce (blue line, **Northern Rila**), beech (yellow line, **Central Balkan Range**) and oaks (red line, **Danube hilly plain**), there are trend for both increasing the divergence between years and the average temperatures

Precipitation quantity in representative forest ecosystems in the period 1964–2005

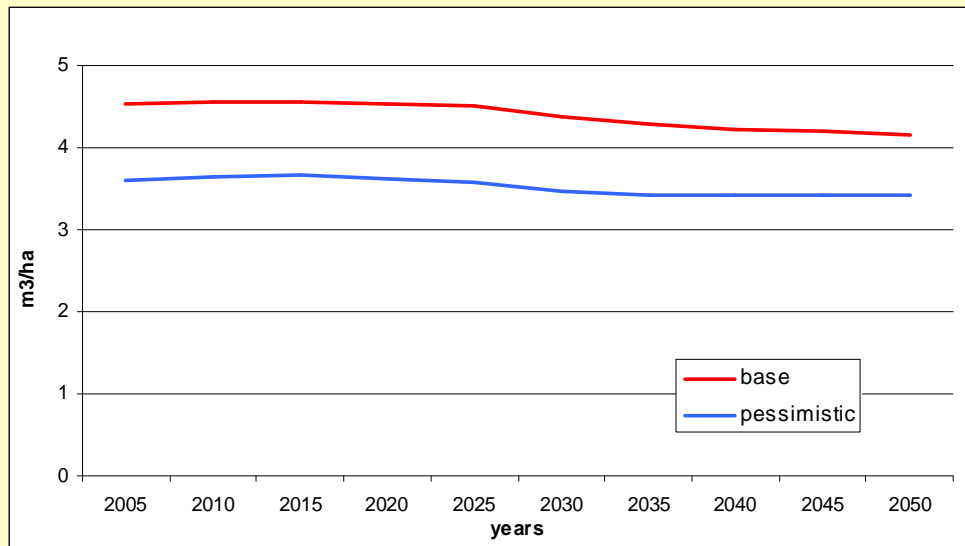


Data about annual precipitation in the same representative forest ecosystems show clear trend for increasing the divergence from year to year, as well as smooth trend for diminishing the quantity of the total precipitations in low regions (oak vegetation belt – red line)

Number of forest fires and burned area in BG (1994-2008) (blue line – numbers; red line – burned area)

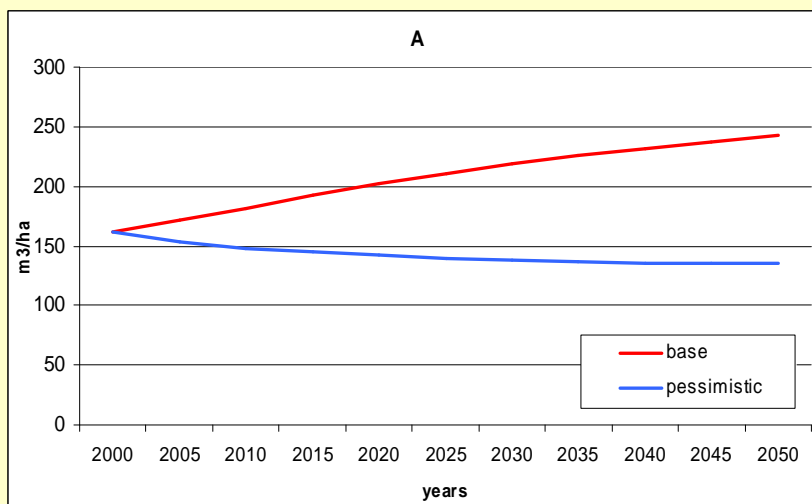


Annual average increment per ha, total for the BG forests, based on EFISCEN simulation (2000-2050)

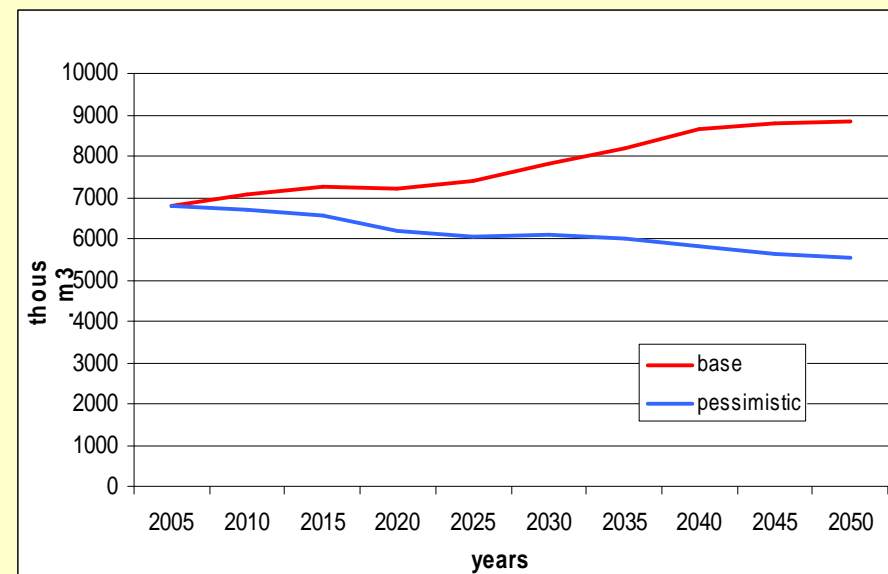


- The traditional or base scenario shows potential forest resources development following current levels of silvicultural treatments.
- The pessimistic scenario take into account some negative tendencies, such as:
 - lack of investments for afforestations;
 - negative effect of disturbances caused by climate changes – low level of stability of young forests, higher and earlier mortality for the mature ones, not adequate natural regeneration etc.

Average growing stock per ha, total for the BG forests, based on EFISCEN simulation (2000-2050)



Annual harvest





Adaptation:

- In 2000 the Council of Ministers of Bulgaria passed the National action plan on climate change, which included an adaptation strategy in different sectors: agriculture, forestry, economy etc.
- Two innovative projects regarding adaptation potential of a representative forest ecosystem in Rila mountain and a forest plantation in waste banks were assigned in the forest sector. Projects were implemented by Forest research Institute, Sofia.



State Forestry Agency
(<http://www.dag.bg>)



Ministry of agriculture and food
<http://www.mzh.government.bg>

Ministry of environment and Water
<http://www.moew.government.bg>

- The base national forest document, which refers to the climate change prevention, is *“The strategic plan for the forest sector development 2007-2011”*.

- The strategic goal 2, according to this plan is to establish and maintain vital forest ecosystems, the following key action being envisaged:

Improvement of the resistance, health conditions and adaptation of forests to climate change and anthropogenic influence.





The following main adaptation measures in forests management are suggested in order to mitigate the climate change effect on forest vegetation:

- Priority of natural regeneration or more drought resilient species afforestation;
- Timely thinning activities;
- Preferable harvesting of stands damaged by fires and climate effects (windstorm, snowfall etc);
- Establishment of data base for forest pathology and entomology monitoring and net of experimental stations;
- Establishment and maintenance of forest road infrastructure in stands with insufficient adaptive potential which are expected to suffer more the climatic impacts;
- Forest nurseries production and choice of species focused on broadleaves – predominantly oaks. From conifers Austrian pine and cedars are preferable, especially on dry sites.

Carbon accounts (sequestration) and Kyoto protocol: data availability and current research studies.

Until 2006 in Bulgaria in Land Use, Land-Use Change and Forestry sector (LULUCF) only data from aboveground biomass had been included.

The lack of summarized data on the other components like soils, forest litter, dead biomass etc was partially filled in 2007, when the Bulgarian State Forestry Agency financed the project for “Preparation of Methodology for collection, analysis and verification of data from forests in the national GHG inventory”, elaborated by the team of experts from the Forest Research Institute, University of Forestry in Bulgaria and Energy Institute LTD (SFA, 2007).

Information regarding forest carbon sequestration in Bulgaria (in terms of m^3 of growing stock), provided by the national forest inventories, concerns the aboveground vegetation only. Information on C accumulation in soils, forest litter and dead wood biomass, as well as belowground C pool is not included.

At present Bulgarian scientists participate in COST 639 “Greenhouse-gas budgets of soils under changing climate and land use” and elaborate projects related with land-use change effects on carbon sequestration in soils.

Conclusions

- ❑ The research regarding effect of climate change on forest vegetation and visa versa started 10-12 years ago in the field of sivliculture, meteorology and forest ecology.
- ❑ The national legislation mechanism is still not sufficient.
- ❑ Elaboration of joint projects and programs with neighboring countries are in the initial phase.
- ❑ Silvicultural measures as a respond to climate change impact has started to be implemented.



Thank you for your attention!