Impact of climate change

Use of climate model results
Use of RCM climate simulations

- Raw model data: difference between 30 years mean values for two periods
- Bias corrected model data: if use of daily data is needed!

- Make connection: temperature/precipitation and phenology
- Use the connection to analyze change of the parameter of interest
Impact of climate change on viticulture

Serbian viticulture regions; base period 1961-1990; use of bias corrected RCM data for 21st century.

General conclusions:
- warming and drying of Serbian vineyards
- appropriate climate conditions for vine growing shift to higher altitudes (~1000m altitude)
- higher risk of spring frost,
- extended growing season
- early ripening, possible double ripening,
- higher concentration of sugar due to extended dry periods during growing season
- disturbance in preparation for rest period

Impact of climate change on forestry

- Observed flowering for ~100 woody taxa (2007-2012)
- Belgrade region
- Connection between temperature and flowering: threshold for mean 30 days temperature before flowering for each taxon
- Bias corrected data needed
- Calculated flowering for base period 1961-1990 and for future periods in 21st century
Impact of climate change on forestry

Belgrade region; ~100 Woody taxa
base period: 1961-1990
Flowering depends on 30 days mean temperature before flowering.

General conclusions:
- Shift in flowering
  2001-2030: 10-30 days
  2071-2100: 20-45 days
Other impacts of climate change

- Higher temperatures, less precipitation
- Higher frequency of extreme temperatures, longer periods without precipitation – draught
- Higher frequency of extreme events

Climate is changing, unknown weather in upcoming seasons:

⇒ Early warning system needed to prepare for extreme weather conditions
⇒ Need for developing full system: seasonal, monthly, medium and short range forecast
Mean monthly temperature forecast during the heat wave
Leading months: January – September 2012
Climatology: 1961-2010
Observations: Rimski Sancevi, Vojvodina, Serbia, 2012
Percentiles: (min), 10, 25, 50, 75, 90, (max)
Mean monthly temperature forecast during the heat wave
Leading months: January – September 2012
Climatology: 1961-2010
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Percentiles: (min), 10, 25, 50, 75, 90, (max)
Start/end of the growing season period – year 2012

6 consecutive days with T>10C during Jan-Jun – start
6 consecutive days with T<10C during Jul-Dec – end

Leading months: January – September 2012
Climatology: 1961-2010
Observations: Rimski Sancevi, Vojvodina, Serbia, 2012
Percentiles: (min), 10, 25, 50, 75, 90, (max)
Grapevine ripening date for GDD 2800/3500 – year 2012

Start of the growing season fixed on 1. april, GDD=sum(T), if T>10°C
Ripening date = first day when GDD reached 2800/3500 heat units

Leading months: January – September 2012
Observations: Rimski Sancevi, Vojvodina, Serbia, 2012
Percentiles: (min), 10, 25, 50, 75, 90, (max)

Early varieties

Late varieties
Adaptation

• Collaboration with different sectors of economics
• Analysis of climate change impacts according to the need of users
• Preparation of data in the form understandable for others
• Use of collected knowledge on climate change impacts in sectors of economy
• Preparation of forecast products in the form usable for others