Basin characteristics

Otava river basin / Vltava river basin
Since 1976, still in operation
13°40'56"E; 49°03'57"N; 828 m a.s.l.
0.09 km²
Elevation range:
828 – 1074 m a.s.l.
Basin type:
Mountainous
Climatic parameters:
(mean precipitation, temperature and others)
Mean precipitation:
861 mm (1976-2008), 6.3 °C (1976-2008)
Land use:
100% Afforestation (acid spruce beech type of forest)
Soils:
Oligotrophic forest Eutric Cambisol
Geology:
Proterozoic biotite paragneisses and migmatics locally
underlain by Holocene deluvial-fluvial loams and deposits
Hydrogeology:
Fractured rock aquifer with a shallow near-surface
aquifer confined to morphological elevations
Characteristic water discharges
1.03 l/s; 207,5 l/s; 15,67 l/s (1976-2008)

Map of the research basin

Mean hydrograph / Pardé flow regime

Special basin characteristics
(hydrogeology, lakes, reservoirs etc.)
Sacramento soil moisture accounting model (SAC-SMA)
Model scheme and air runoff components generated by the model
OFR - direct runoff, from those parts of the basin which become
impermeable after saturation; NIW - the runoff from the part of basin which
is permanently impermeable; SUR - surface runoff; INT - interflow; SUP -
secondary baseflow (i.e. essentially the seasonal component of
baseflow); PRM - primary baseflow, i.e. long term part of baseflow)

Instrumentation and data

<table>
<thead>
<tr>
<th>Measured hydrological parameters</th>
<th>Measuring period</th>
<th>Temporal resolution</th>
<th>Number of stations</th>
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</thead>
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<tr>
<td>Stream flow</td>
<td>Nov 1975 – cont.</td>
<td>10 min (since 1993)</td>
<td>1</td>
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<tr>
<td>Air temperature, humidity</td>
<td>1976 – cont.</td>
<td>1h / 10 min.</td>
<td>1</td>
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<tr>
<td>Groundwater level</td>
<td>1997 – 2007 – cont.</td>
<td>Weekly</td>
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<td>Sap Flow</td>
<td>2005 – cont.</td>
<td>10 min.</td>
<td>6</td>
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<tr>
<td>Environmental isotope ¹⁸O</td>
<td>2007 – cont.</td>
<td>Weekly</td>
<td>2</td>
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Applied models

1. SAC – SMA Model
2. RETU Model
3. BROOK ’90 Model
4. Micrometeorological Deposition Model

Main scientific results

1. The soil water movement and retention play the leading role in the runoff formation in Liz catchment.
2. Occult precipitation represents an important factor affecting water and mass balance in the headwater region in the Czech Republic. In the Sumava Mts, fogwater showed high acidity and NH₄⁺, SO₄²⁻ and NO₃⁻, were the dominant species in fog-water.
3. Simulation of phytomass productivity based on the optimum temperature for plant growth in a cold climate was studied:
   - The optimum temperature of 25 °C for plant growth in the present day conditions in the cold climate areas lowers both risks of reduction or cessation of plant growth.
   - In the case of lower optimum temperatures for plant growth, higher consumption of water for transpiration could result in a depletion of water sources, increases in plant temperature owing to a drop in transpiration, and finally a reduction or cessation of plant growth as a consequence of the high temperature of the plant.
   - In the case of higher optimum temperatures for plant growth, the heat from solar radiation is not sufficient for heating up the plants to this temperature, resulting in a reduction or cessation of plant growth as a consequence of the low temperature of the plant.
   - We can conclude that monitoring of the hydrological regime in mountain localities in the Czech Republic and simulation of the phytomass productivity showed that the optimum temperature for plant growth is 25 °C, and that plants growing at this optimum temperature produce the biggest volume of phytomass in the long-term.

Key references for the basin


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