

**Scientific Conference: Impacts of the Drought and Heat in 2003 on Forests**

# **The regime of precipitations in 2003 in Romanian Forests**

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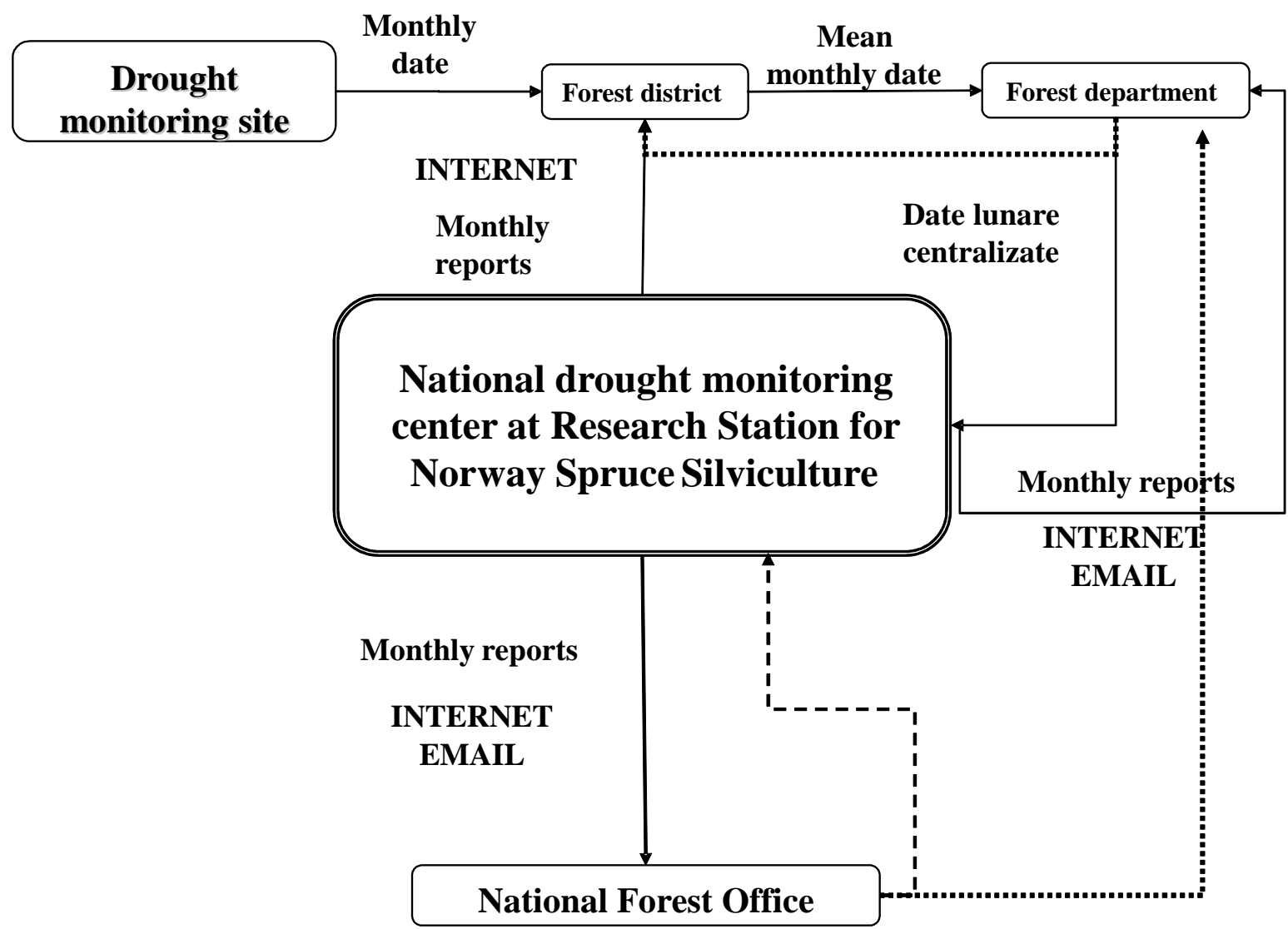
Forest Research and Management Institute  
Câmpulung Moldovenesc - ROMANIA

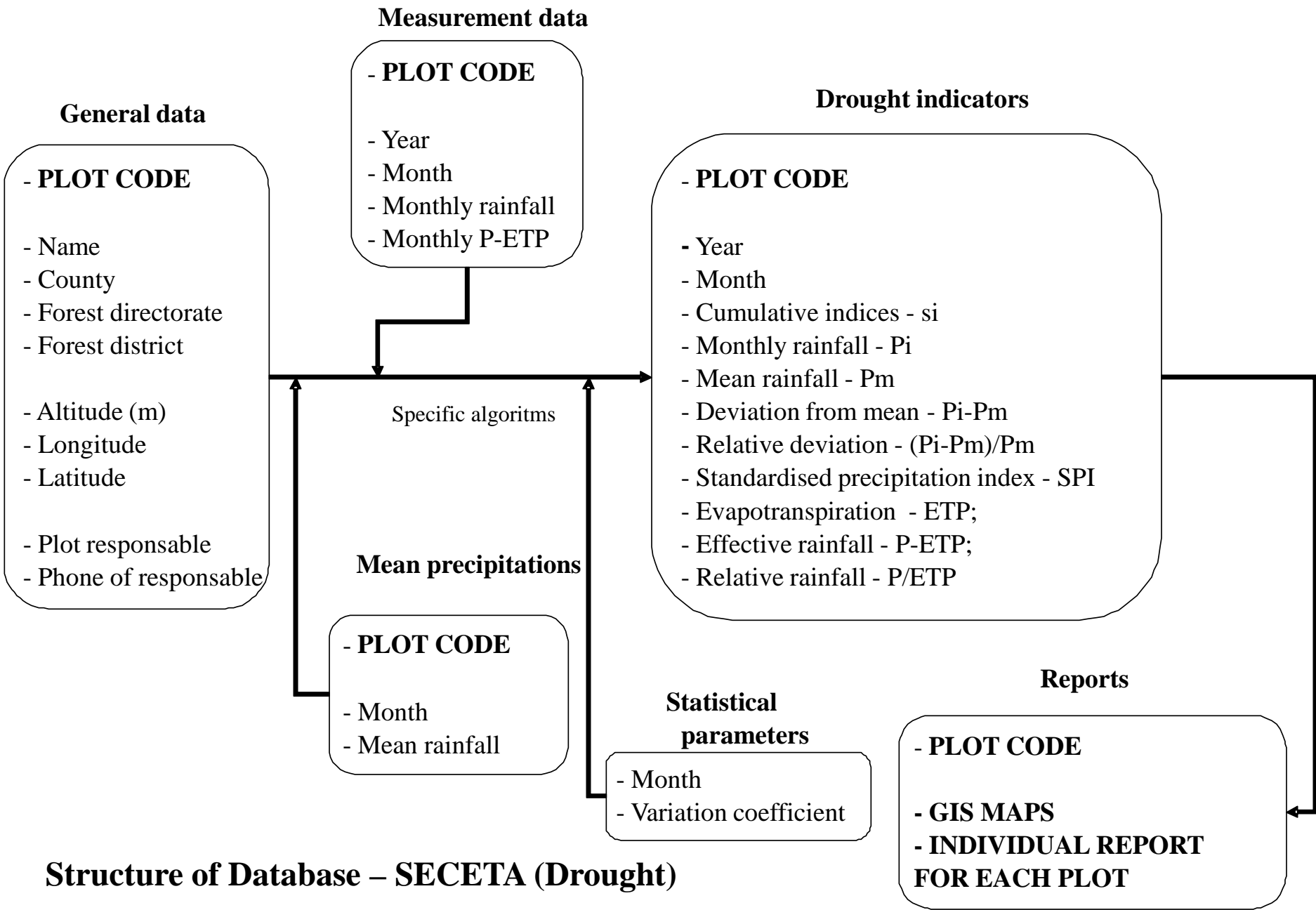
# Network of permanent plots for rainfall measurement in Romanian Forest



**Red dots represent the permanent plot and Sector represent the Forest Districts**

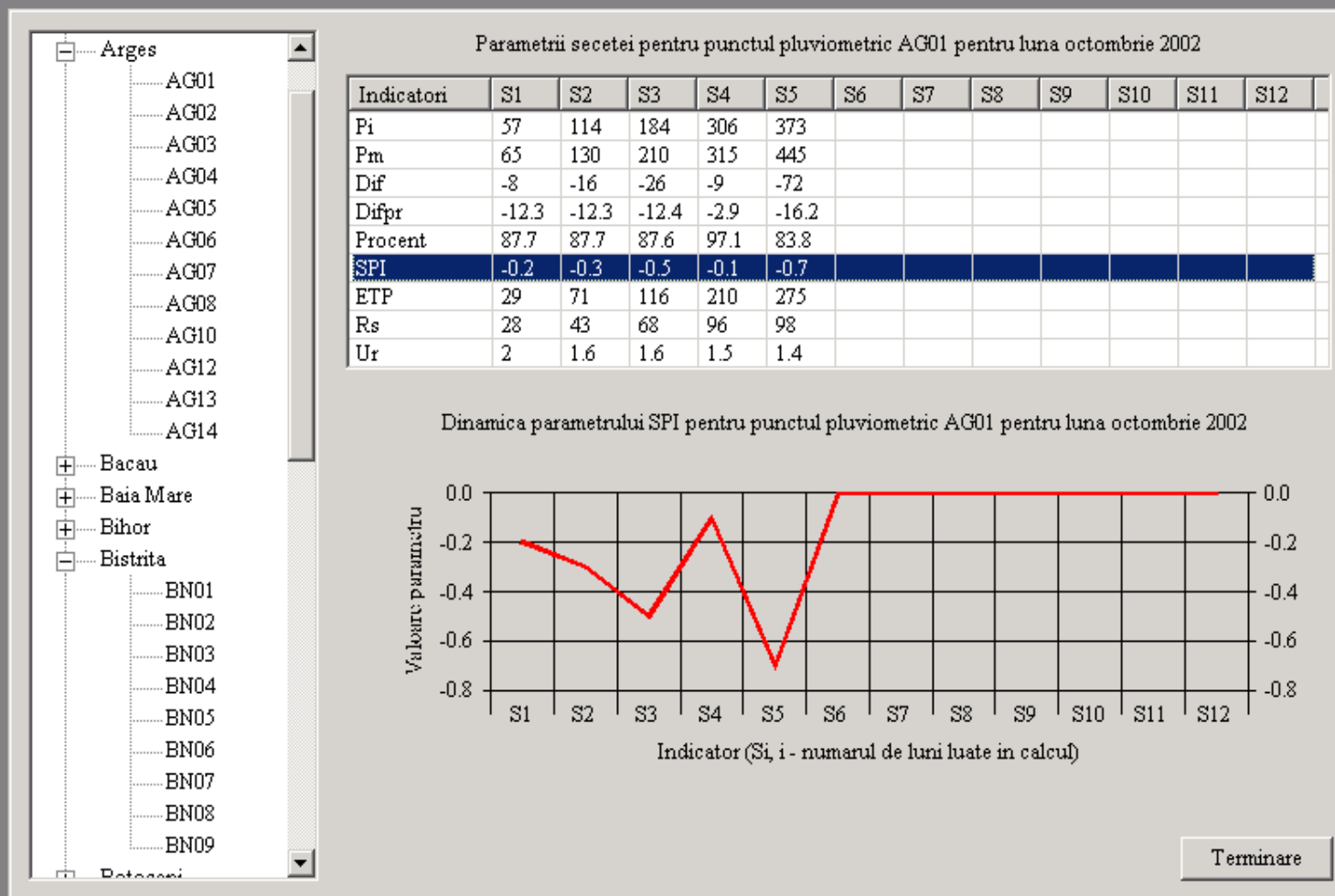
# Flux of the data in the frame of the project “Drought Risk Monitoring in Romanian forests”

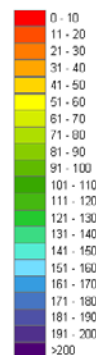




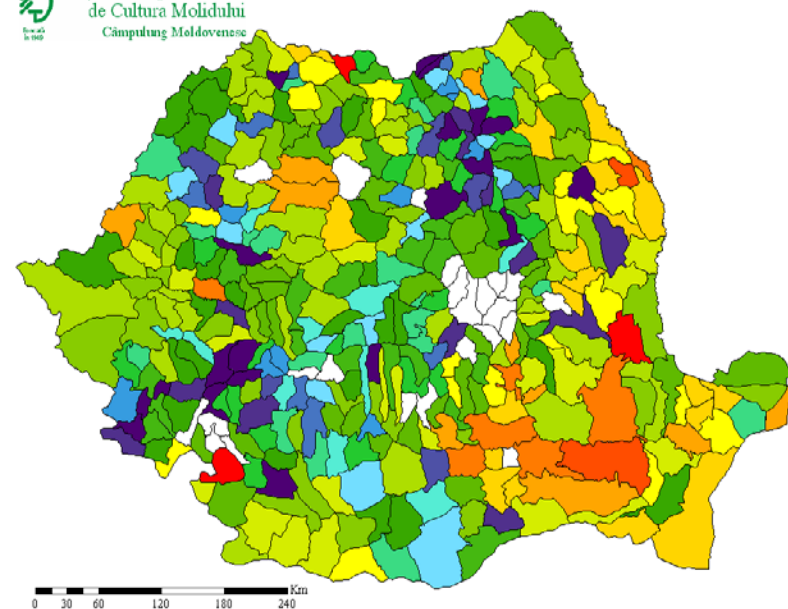
**Structure of Database – SECETA (Drought)**







## Two manner of synoptic presentation of the rainfall parameters for the drought characterisation

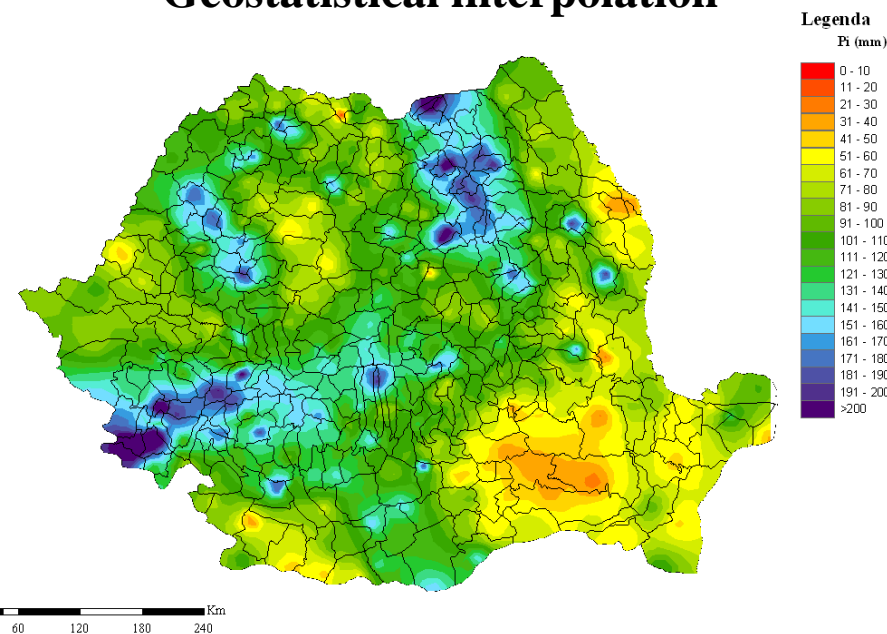


Cantitațiile de precipitații căzute în luna august 2002 în ocoalele silvice din România

**Rainfall in august 2002 in the Forest districts in Romania**

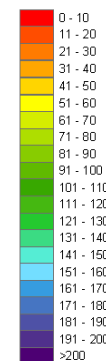
**Method of color patches**

## Geostatistical interpolation



Legenda

Pi (mm)



Cantitațiile de precipitații căzute în luna august 2002 în ocoalele silvice din România

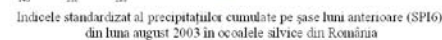




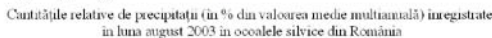
**Pi**



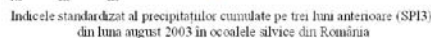
# SPI1



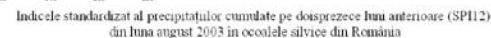
## SPI6



**P%**



## SPI3



## SPI12

## Examples of thematic maps for the characterization of the drought (rainfall regime) using Standardised Precipitation Index in august 2003

# Climatic synthesis of 2003

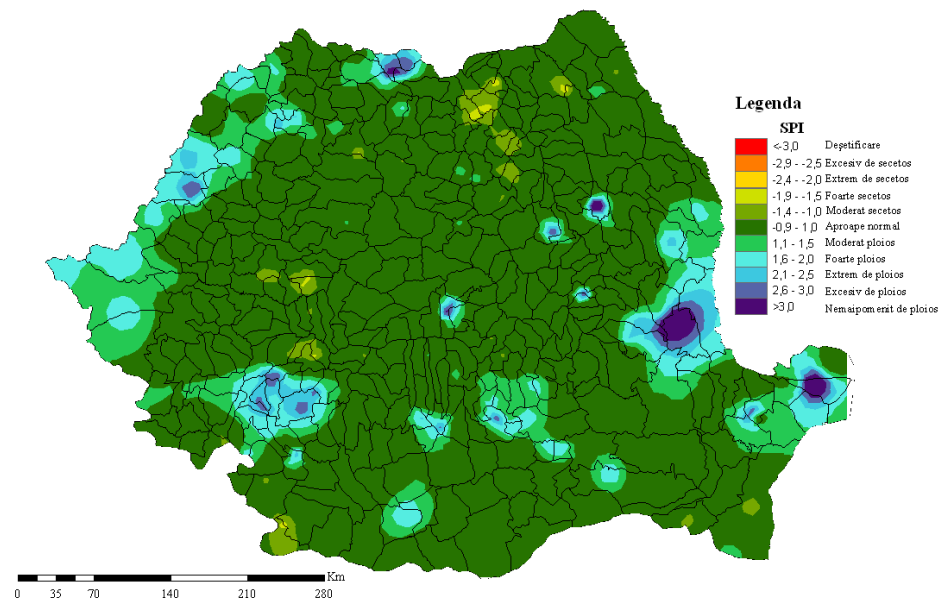
Temperature regime shows, in 2003, that the winter and spring were cold, in the first four months being with 3-3,5°C lower than the mean of the period, on the whole Romania. The growing season (April-October) has had higher temperatures than the mean with 2-4°C. It must be noted that at the end of April, the temperature jumps from negative values to +20-+30°C (we can better understood the effects of heat shock on the vegetation). In the second half of October and first half of November a cold wave made temperatures lower with 1-2°C than the mean. In December the temperatures were higher (with 2-3°) than the mean. In such conditions, evapotranspiration in the growing seasons has had higher values than the mean. Coupled with the rainfall deficit from the first part of the growing period, this conducts to severe reductions of soil moisture in the first 40-60 cm, with negative effects on the agricultural crops, but also on the young stands and nurseries. Regional, the variations of the temperature, according with the mean values, were irregularly distributed, the warmest regions being in the Western and Central part of Romania.

Concerning the precipitation regime, the winter and the spring were rainy; the most part of growing season (May-August) were dry in the north-western regions, with a severe and prolonged droughts. Colour maps are available on the web <http://www.icassv.ro/seceta/sinteza2003/sinteza.php>. Heavy rainfall registered at the end of the summer (in Moldova) and in September (in the Southern regions) couldn't save the damages registered by the ecosystems. In some forest districts, located in the Southern Romania, flooding damages has occurred on large areas.

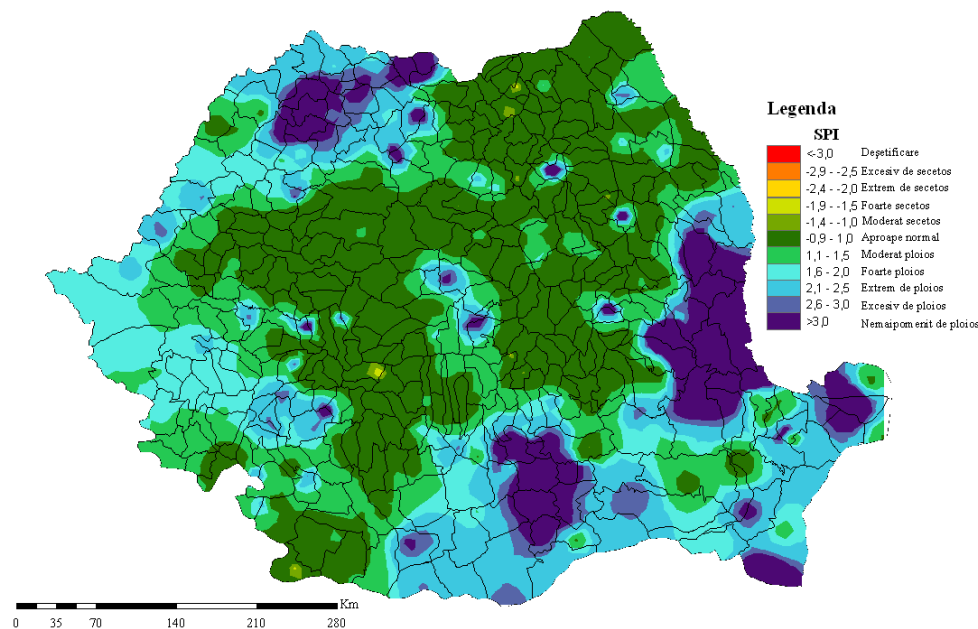


**The rainfall regime in the winter 2002-2003.** The rainfall registered in the period December-February were higher than normal values in the most part of Romania and moderately wet to very wet in the outside regions of Carpathians (Western plains, South of Moldova, Bărăgan and Dobrogea). If we consider also the rainfall regime registered in the autumn of 2002 (Barbu & Popa, 2003) the precipitation regime on the last six months (from February 2003 - fig. 2) has had the following characterisation:

- moderately wet to excessive wet in the outside regions of Carpathians, especially in the Southeastern, Southern and Western regions.
- normal to moderately dry in the mountainous area.



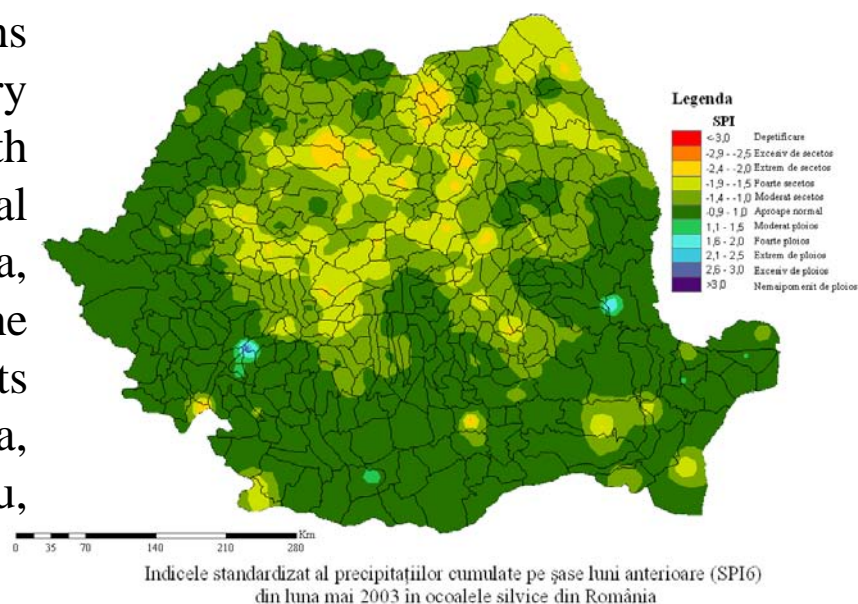
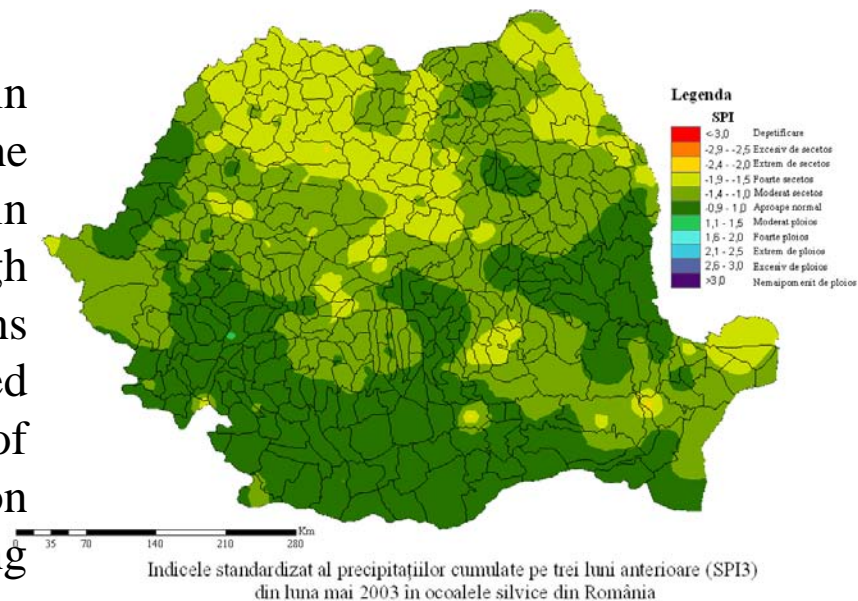
Indicele standardizat al precipitațiilor cumulate pe trei luni anterioare (SPI) din luna februarie 2003 în ocoalele silvice din România



Indicele standardizat al precipitațiilor cumulate pe trei luni anterioare (SPI) din luna februarie 2003 în ocoalele silvice din România

**Rainfall regime in the spring 2003** was dry in the whole country. In March, in western regions the rainfall represents only 20-40% of the mean, and in the eastern parts of Romania 50-70%. In April high deficits were registered in the north-eastern regions and excesses in the south-western. Rainfall registered in May were very low, representing only 20-50% of the mean. The values of the standardised precipitation index for three months (SPI3) shows that the spring 2003 were moderately dry to very dry in the northern and south-eastern regions.

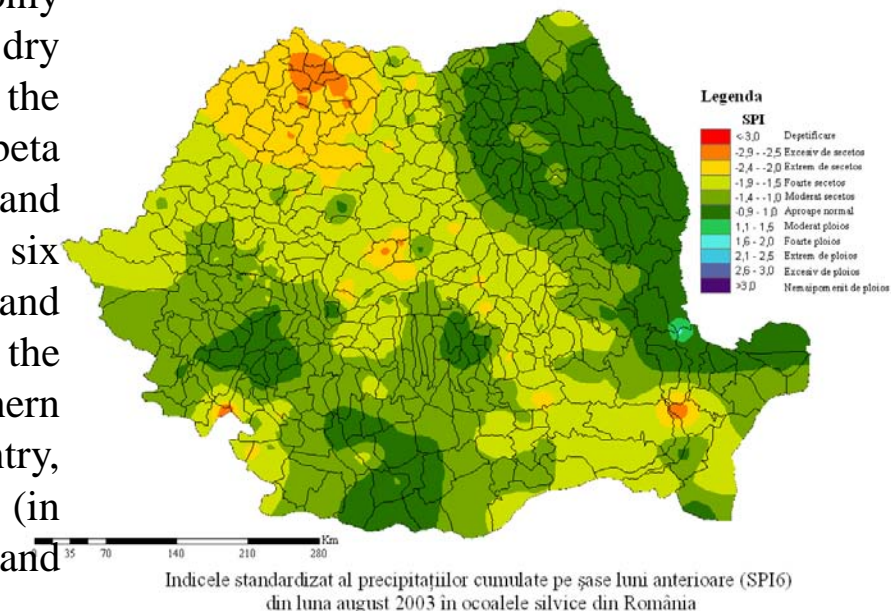
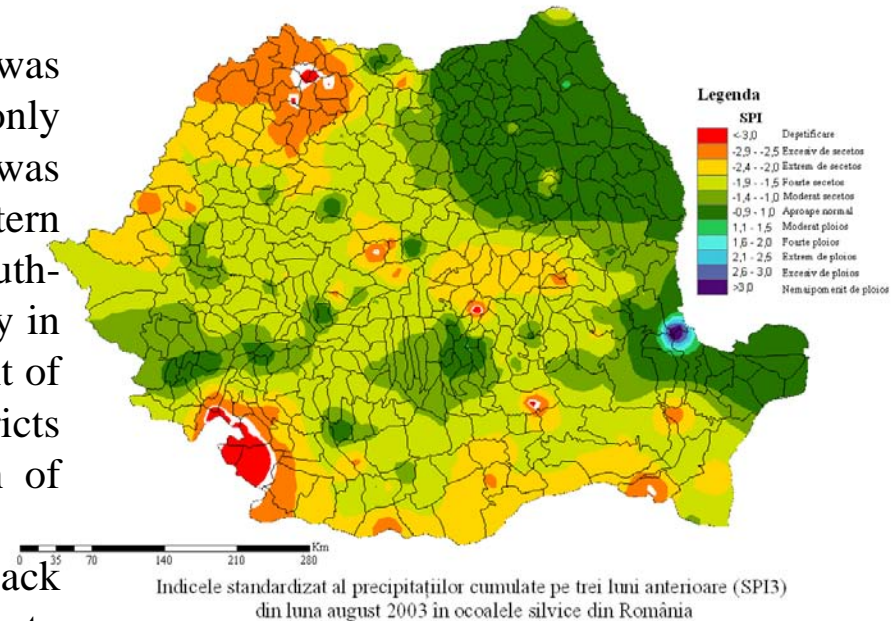
Analysing the SPI values for previous six months (beginning form May) can be show a moderately dry to extremely dry regime in Transylvania, in the north of Moldova and in the east of Carpathians. At a local scale, the same regime was registered in Oltenia, Baragan and Dobrogea (in the southern part). At the start of the growing seasons, the most affected forests by drought were located in the counties Cluj, Alba, Sibiu, Suceava, Harghita, Botosani, Iasi, Buzau, Ploiesti, Craiova, Ialomita and Dambovita.



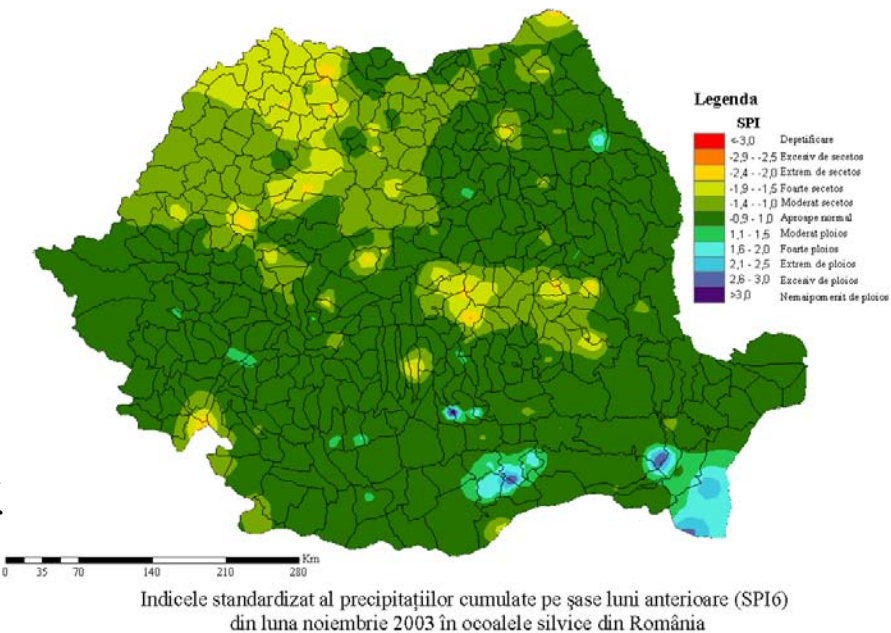
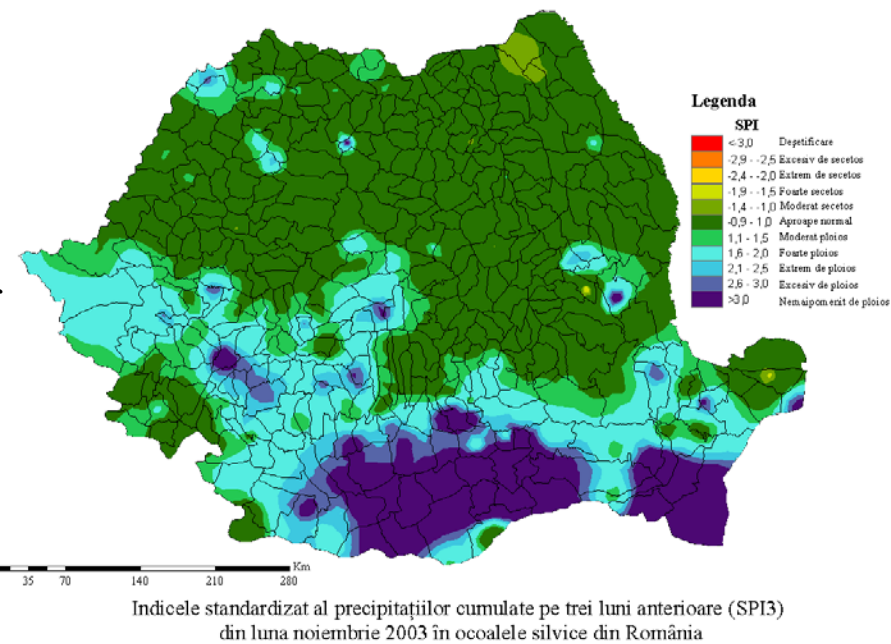


**Rainfall regime in the summer 2003.** The June was very dry in the whole country, the rainfall representing only 10-40% of the June mean precipitation. July was moderately wet to extremely wet in the north-eastern regions and near normal to moderately dry in the south-western regions. August was moderately dry to very dry in the western part and near normal in the rest. The amount of rainfall represents 10-50% in the western forest districts and 50-90% in the south Moldova and in the North of Dobrogea (southeastern part).

Analysing the values of SPI for three months back (SPI3) (from August), the summer 2003 was very dry to excessively dry for the most part of the territory and, only in the north of Moldova and in Dobrogea, moderately dry to near normal. The most affected forest were located in the branches of RNP Baia Mare, Satu Mare, Zalău, Drobeta Turnu Severin, Braşov, Sibiu, Alba Iulia, Alexandria and Constanţa. Analysing the values of SPI for the previous six months (SPI6) from August, we observe that the spring and summer of 2003 were very dry to excessively dry in the most part of Transylvania, in Southeastern and Southern regions and in Mehedinţi County. In the rest of the country, the rainfall regime were moderately dry to near normal (in Moldova, Southeastern and Southern regions and Dobrogea)



**The rainfall regime in the autumn 2003.** In September the rainfall regimes were wet in the South of Romania (120-200% of the mean) and dry in the northern regions (30-80% of the mean). October was rainy in the whole country, the rainfall representing 120-250% of the mean (exception being the north of Moldova and the Danube Delta). In November the rainfall was close to normal values, exceeding these in the southern regions and being lower than, in northern Romania (excepting the northwest). Analysed through SPI3 (back from November) the autumn 2003 was moderately wet-excessively wet in the southern half of the country and near normal in rest. The values of SPI6 (back from November) shows that the summer-autumn season of 2003 were very dry in Satu Mare, Baia Mare and Brasov counties, moderately dry in the Oradea, Zalau, Bistrita, Cluj, Alba, Buzau, Vrancea counties and locally in south-western regions. At the end of the year 2003, the standardised precipitation index (SPI3) shows a near normal regime of rainfall, in the most part of Romania (only in the central part of Southeastern and Southern regions was moderately wet to very wet



# Synthetic characterisation of rainfall regimes registred in 2003 in different zones of Romania

| Zone of the country | Season (month) |              |                |              | Semester (month) |         | Growing season IV-IX | Year 2003 I-XII |
|---------------------|----------------|--------------|----------------|--------------|------------------|---------|----------------------|-----------------|
|                     | Winter XII-II  | Spring III-V | Summer VI-VIII | Autumn IX-XI | I-VI             | VII-XII |                      |                 |
| N                   | NN             | MD           | VD             | NN           | VD               | NN      | MD                   | VD              |
| NE                  | NN             | VD           | NN             | NN           | VD               | NN      | MD-VD                | VD              |
| E                   | MW-VW          | NN           | VD-MD          | NN           | MD-VD            | NN      | NN                   | NN              |
| SE                  | MW-NN          | MD-VD        | VD-EXD         | VW           | MD               | VW-EXW  | MD-NN                | NN              |
| S                   | NN             | NN-MD        | MD-VD          | VW           | MD               | NN      | NN-MD                | NN              |
| SW                  | MW-NN          | NN-MD        | MD-VD          | VW           | MD               | NN      | MD                   | NN              |
| VW                  | MW-VW          | NN-MD        | VD-EXD         | NN           | VD               | NN      | VD                   | VD              |
| NW                  | NN             | VD           | VD-EXD         | MW-NN        | EXD              | NN      | EXD                  | EXD             |
| Central             | NN             | MD-VD        | VD-EXD         | NN           | EXD              | NN      | VD                   | EXD             |

## LEGEND :

| Regime | Excessive dry | Extreme dry | Very dry  | Moderate dry | Near normal | Moderate wet | Very wet | Extreme wet | Excessive wet |
|--------|---------------|-------------|-----------|--------------|-------------|--------------|----------|-------------|---------------|
| Symbol | EXD           | ED          | VD        | MD           | NN          | MW           | VW       | EW          | EXW           |
|        |               |             |           |              |             |              |          |             |               |
| SPI    | < -2,5        | -2...-2,5   | -1,5...-2 | -1...-1,5    | -1...1      | 1...1,5      | 1,5...2  | 2...2,5.    | > 2,5         |

# Thank you for your attention!

