Landscape-scale water balance in a montane forest, southeastern Brazil using climate data at various levels of spatio-temporal resolution

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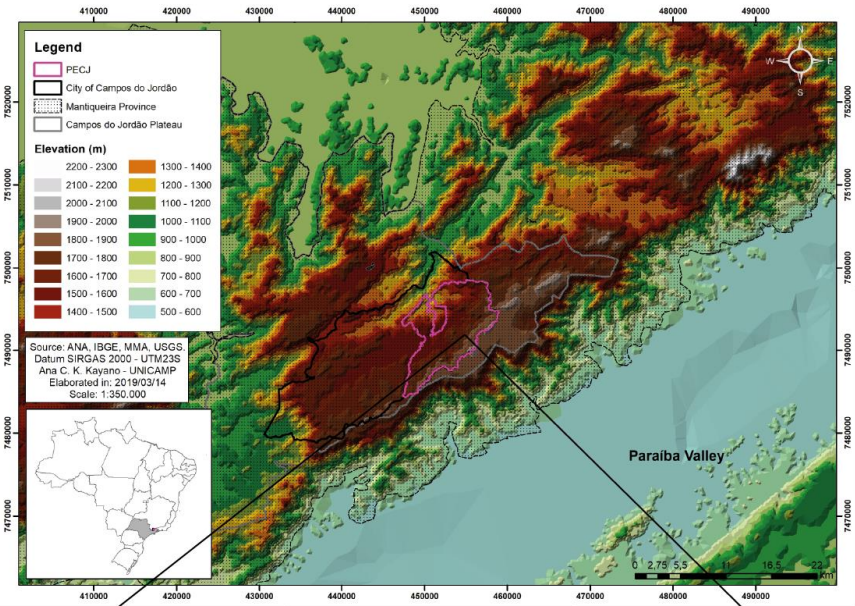
Hypsometric map of Campos do Jordão



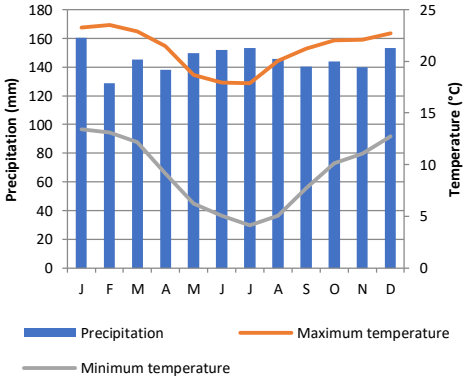
Grassy shrubland vegetation on the summits

Forest in the valleys

Long-Term Ecological Research (LTER) in Parque Estadual de Campos do Jordão, Brazil

We want to uncover and identify the factors that cause the vegetation configuration and refine models made at the landscape scale.

Mean monthly total precipitation and mean maximum and minimum monthly temperature in Campos do Jordão



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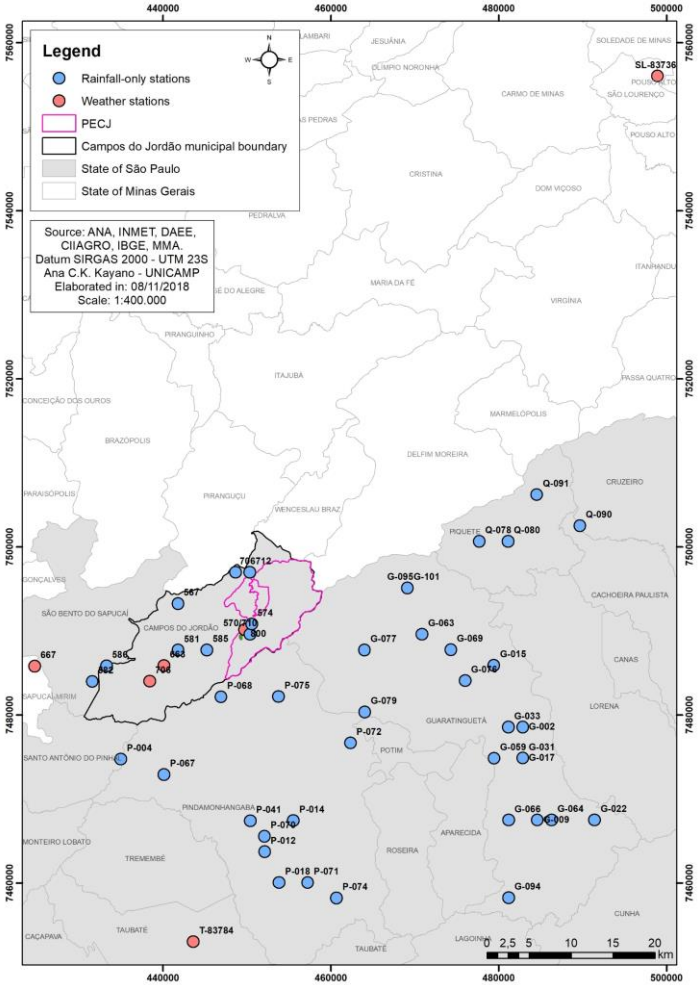
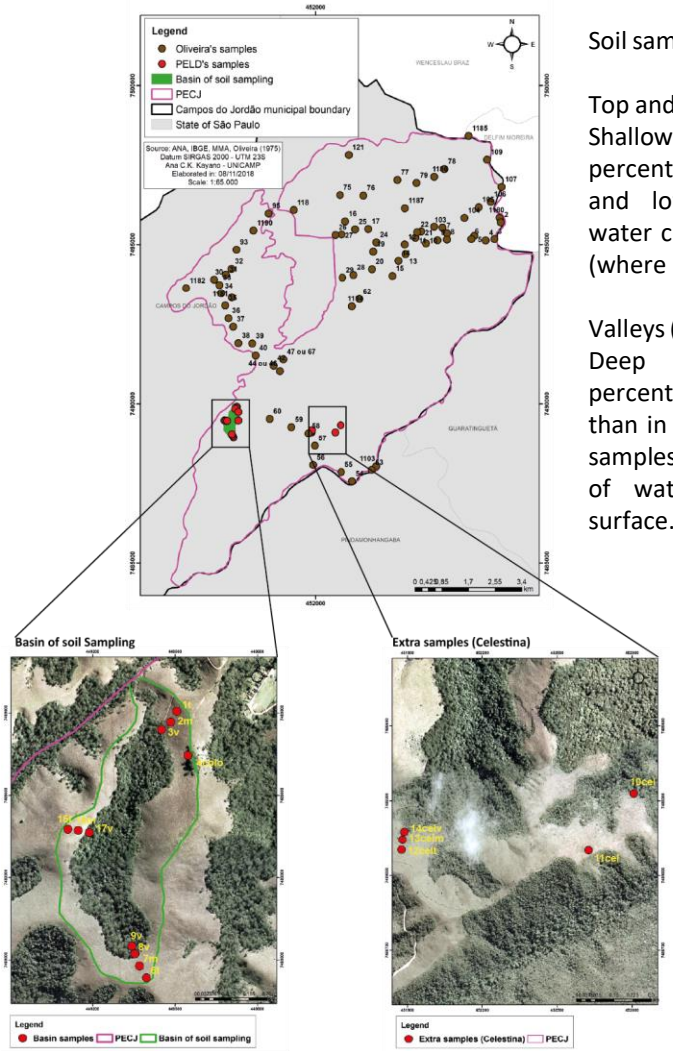
Stations in Campos do Jordão and nearby cities



P and T since 1961 homogenized with climatol package (R). Radiation estimated with RadEst software.

Basin of soil sampling in Parque Estadual de Campos do Jordão



Soil samples analysis:

Top and middle:
Shallow soils with high percentages of sand (>45) and lower quantities of water closer to the surface (where roots are).

Valleys (trees):
Deep soils with higher percentages of clay and silt than in the top and middle samples. Higher quantities of water closer to the surface.

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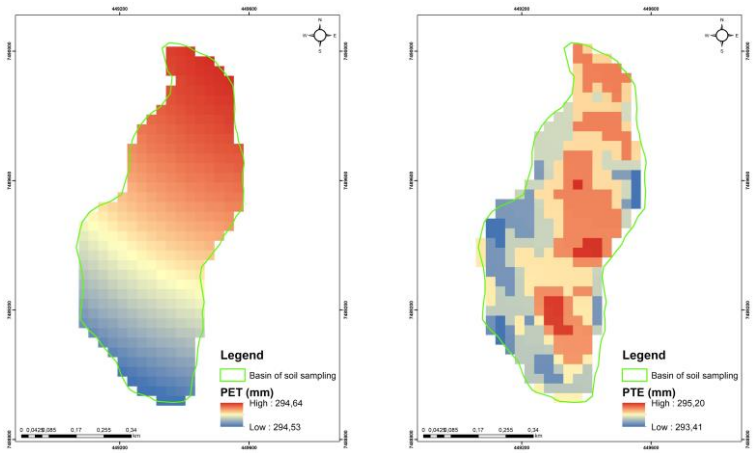
PET in the basins of study for the month of June (30m resolution)

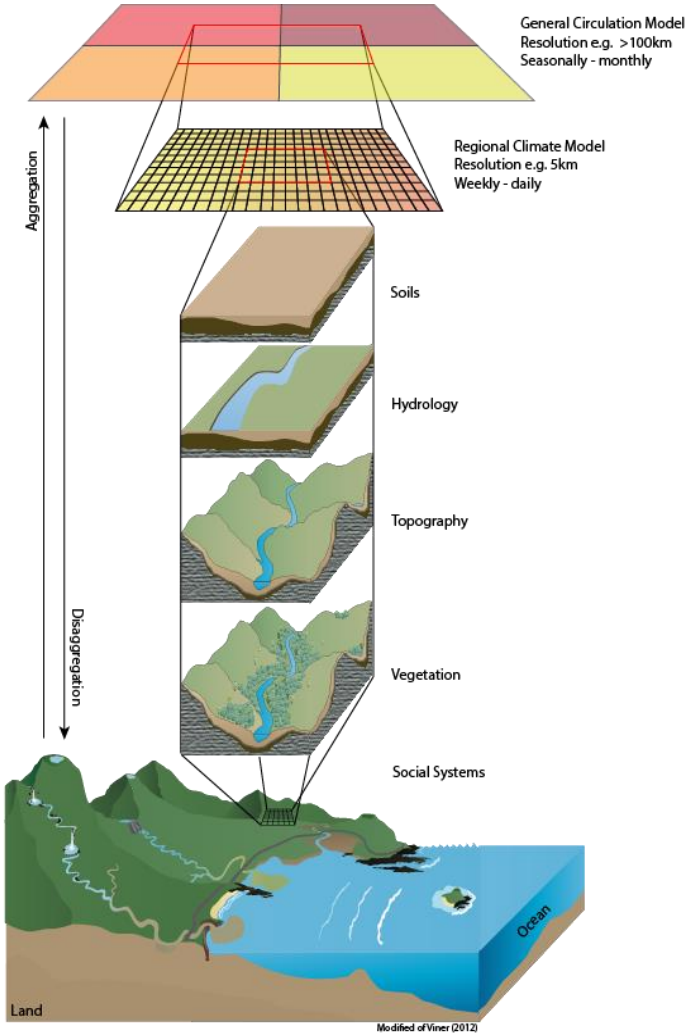
A – Non adjusted **B - Adjusted**



Scale and resolution play important roles in spatial analysis. Adjustments are also necessary to better represent the reality of the studied area.

Once stablished the water balance in the basin:

Refinement at the landscape scale (Mantiqueira range)

Model potential areas where forest can grow in the future

Downscaling process