1. Spatially distributed ET data for Hungary – CREMAP

- Model: Calibration-Free Evapotranspiration Mapping technique (Szilágyi and Kovács, 2011)
- Based on the complementary relationship (Bouchet, 1964), Morton’s WREVP (1985), and using MODIS surface temperature data (linear transformation)

- Validated:
  - Nebraska (USA; Szilágyi, 2013), Hungary – watersheds and eddy towers (Szilágyi and Kovács, 2011)
- Monthly actual ET data (maps) for Hungary (Szilágyi and Kovács, 2011), 2000-2008 period, 1 km² spatial resolution

2. Problem – Objective

- Hungary → forest management → forest compartments (fairly homogeneous forest stands) ~ 5 ha
- 1000 m resolution of CREMAP ET maps → too coarse to be used in precision forest management or agroforestry systems
- Aim: downscale the resolution of ET, from 1000 m to 250 m

3. ET downscaling process

- Co-variable for the statistical downscaling: MODIS NDVI (Normalized Difference Vegetation Index), 250 m resolution
  - Selected time periods: May-October 2003 (drier period), May-October 2005 (wetter period)
  - Water bodies and wetlands are excluded → very low NDVI value (in spite of the high ET)

- NDVI (1000 m) – ET (1000 m) relation → logarithmic regression
  \[ N = 86916 \]

- Quantization process → to ensure that the mean ET of the 16 pixels (with 250 m) does not change within the original 1 km pixel (CREMAP)
- Supplement → ET of water bodies and wetlands (bicubic convolution interpolation)

4. Results

- Intersect: downscaled ET x Hungarian National Forestry Database
- 15 forest stand types separated
- Forest stands - filtered by area: 6.25 ha (250 m × 250 m = 62500 m²) belong to only one stand type
- 10745 filtered pixels in Hungary

Enhancing the spatial resolution of actual evapotranspiration maps for Hungary

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