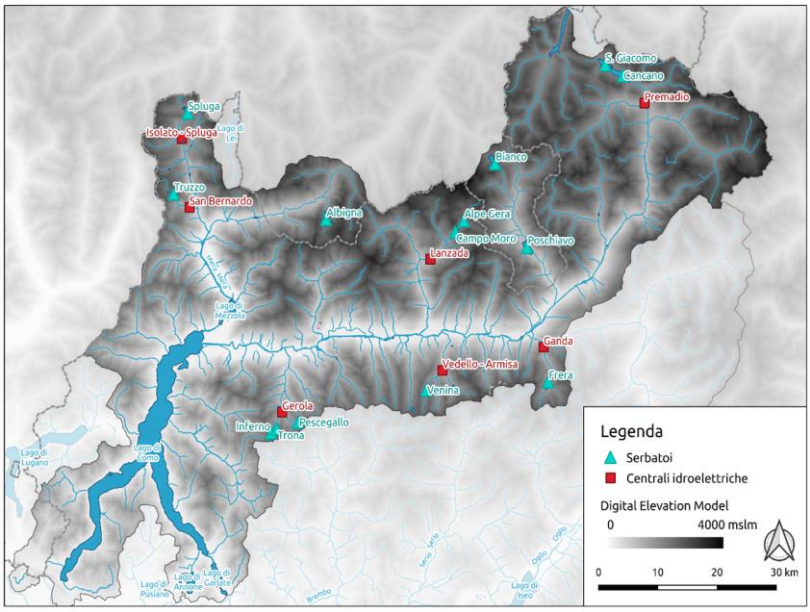
Matlab Project – Part 1

PROJECT OBJECTIVE

- Identify a forecast model of the cumulative 3-day inflow to Lake Como



DATA AVAILABLE (historical data)

Input variables

- Lake Como net inflow [m^3/s]
- Release from S. Giacomo-Cancano dam (Premadio power plant) [m^3/s]
- Release from Spluga dam (Isolato-Spluga power plant) [m^3/s]
- Release from Truzzo Dam (San Bernardo power plant) [m^3/s]
- Release from Frera Dam (Ganda power plant) [m^3/s]
- Release from Venina Dam (Vedello-Armisa plant) [m^3/s]
- Release from Alpe Gera-Campo Moro dam (Lanzada power plant) [m^3/s]
- Release from Inferno-Trona-Pescegallo dam (Gerola power plant) [m^3/s]
- Temperature in 7 stations (Aprica, Gerola, Oga, Palù, Spluga, Vercana, Sondrio) [°C]
- Rainfall in 6 stations (Aprica, Gerola, Oga, Palù, Spluga, Vercana) [mm/day]
- Aggregated rainfall (spatial average) for the basin [mm/day]
- Total Snow Water Equivalent (SWE) in the basin around the Lake [mm]
- Total SWE in the Mera basin [mm]
- Total SWE in the Adda basin upstream [mm]

Output variable

- Cumulative 3-day (average value) inflow into Lake Como [m^3/s]

ADDITIONAL INFORMATION

- Input and output variables are provided for the training (and validation); other data are held out for the final model evaluation.
- Identification procedure should explore different model structure (linear/nonlinear) and order, as well as the subset of input variables to be considered.
- Only proper models are allowed (note that the output is a cumulative 3-day inflow, thus an AR(1) is an improper model)

- Evaluation will consider forecasting accuracy (pay attention to overfitting) and the originality of the solution.
- The original dataset contained some missing values (NaNs), we filled them with an automatic procedure. The reliability of each time series has to be checked before using it as input.
- Remember to justify your modeling choices in the final presentation and in the report.
- Only one model has to be selected for participating in the contest.
- As indicated in the file "script_part1_template.m", use window size equal to 21 days to compute the cyclo-stationary behavior.