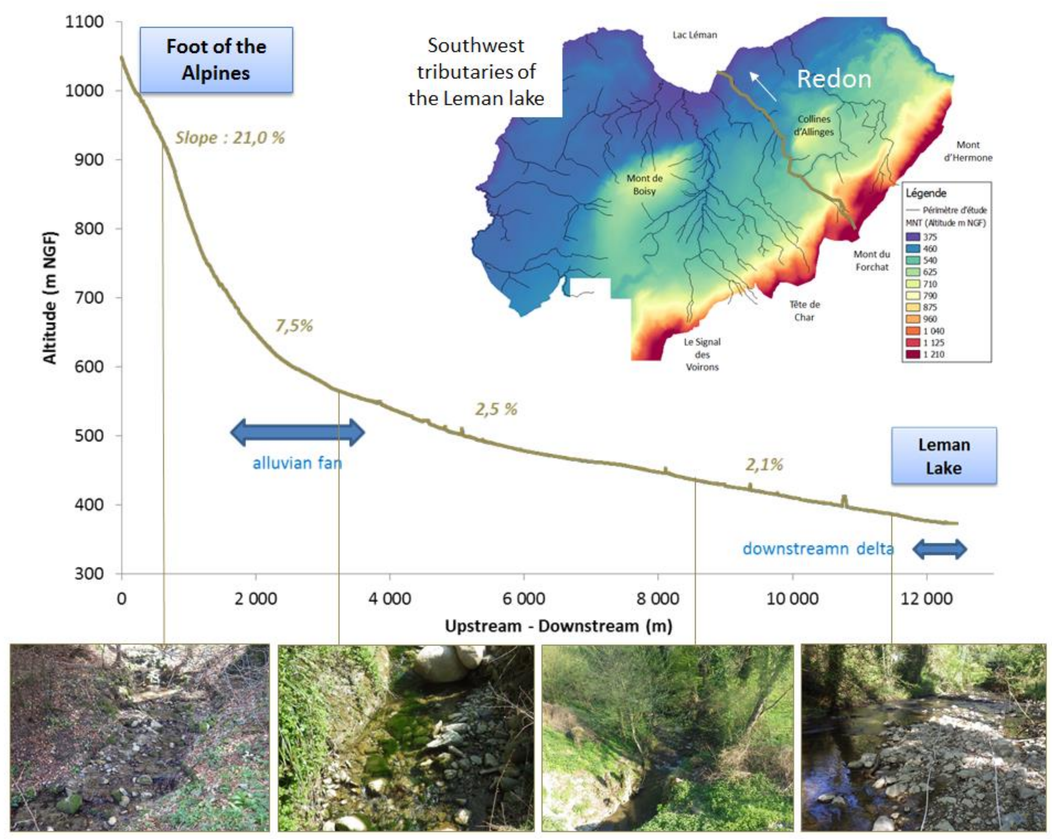
I.S.RIVERS
LYON 2018

DEVELOPMENT OF AN OPERATIONEL METHOD IN ORDER TO DEFINE A RIVER SPACE FOR SOUTHWEST TRIBUTARIES OF THE LEMAN LAKE

Développement d'une méthode opérationnelle de définition des espaces de bon fonctionnement des rivières du sud-ouest lémanique

Context of southwest tributaries of the Leman Lake

Southwest tributaries of the Leman lake extend over a 300-km-long hydrographic network from the upstream foot of the Alpines mountains to the downstream estuaries. The stream bed slope varies from 0,01 % to 25%, with several kinds of river morphology such as mountain streams, braided, meandering and straight channels.



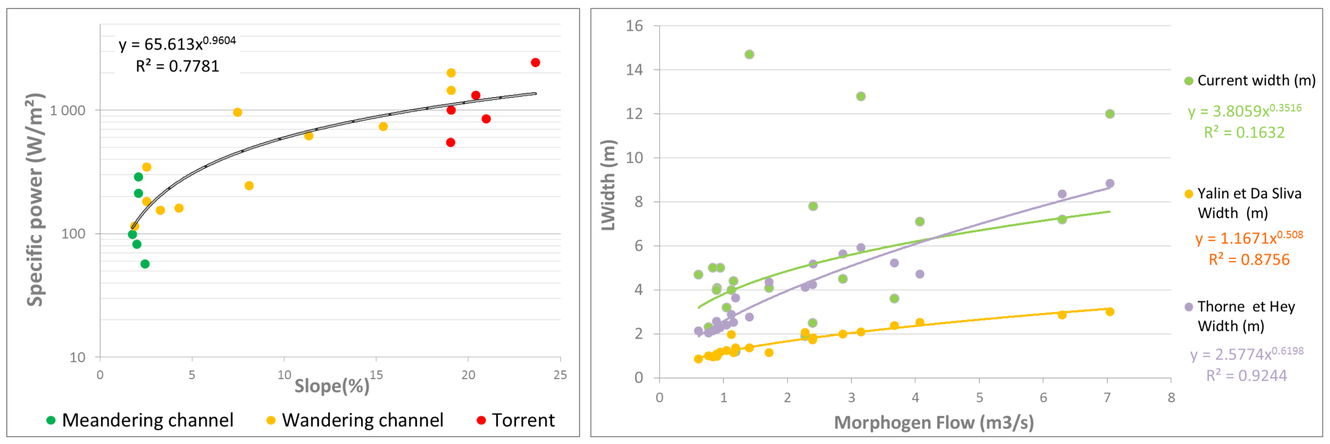
Longitudinal profil of the Redon river from a digital elevation model's data

River channel forms analysis

The river style is an essential tool to help define river space according to various morphological and hydraulic factors.

Hydrographic network was sectorized in homogeneous sections. For every unit, the reference river style was determined by using the following variable :

- **Current and historical width of the river section**
- **Specific power and tractives forces**
- **Bank erodibility and particle-size composition of the substrate**
- **Morphogen flow (2 year flood flow return level)**



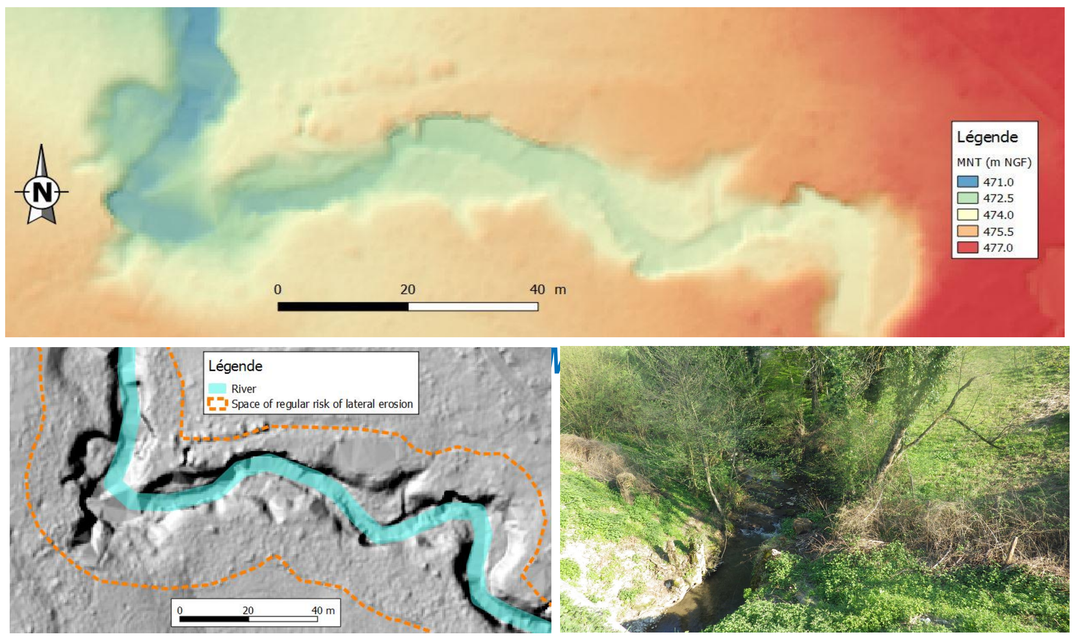
Analysis of rivers variable from different sections

Space river delimitation

The method incorporate the morphological, hydraulic and ecological components of river's dynamic in order to traduce them in a spatial scale and define a sufficient space for the hydrosystem's free development.

Morphological space

2 perimeters are defined, one for the regular lateral erosion phenomena and an other, larger, for the geomorphological context, which result of glacial processes including remnant Rhone glaciers.

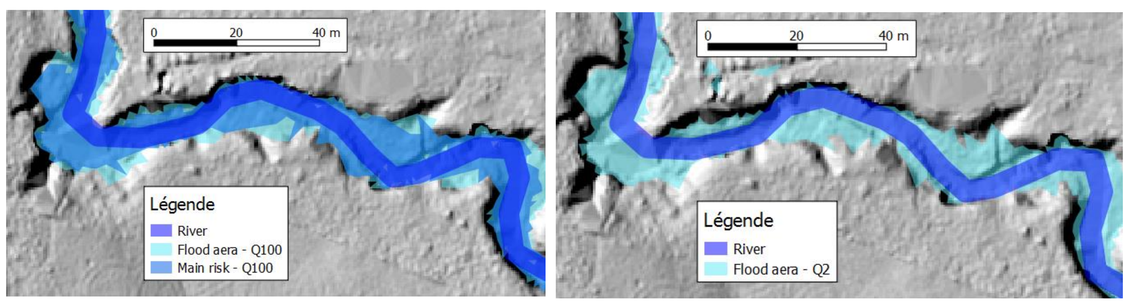


Cartographic analysis of morphological parameters

Hydraulic space

A 2D hydraulic model was built to define, on the one hand, a large and natural space of flood expansion (100 year flood flow return level), and on the other hand, a space representative of main streams. The latter consists of :

- Flood aera for the 2 year flow return level
- Main hydraulic hazards in the flood plain for the 100 year flood flow return level (according to the water speed and level)



Cartographic analysis of hydraulic parameters

Ecological space

For the ecological components, following elements were added :

- Wetlands from the foodplain
- Buffer zone for water quality protection

Thomas LAMBERET - GINGER BURGEAP
t.lamberet@groupeginger.com
THONON AGGLOMERATION
m-guillet@thononagglo.fr