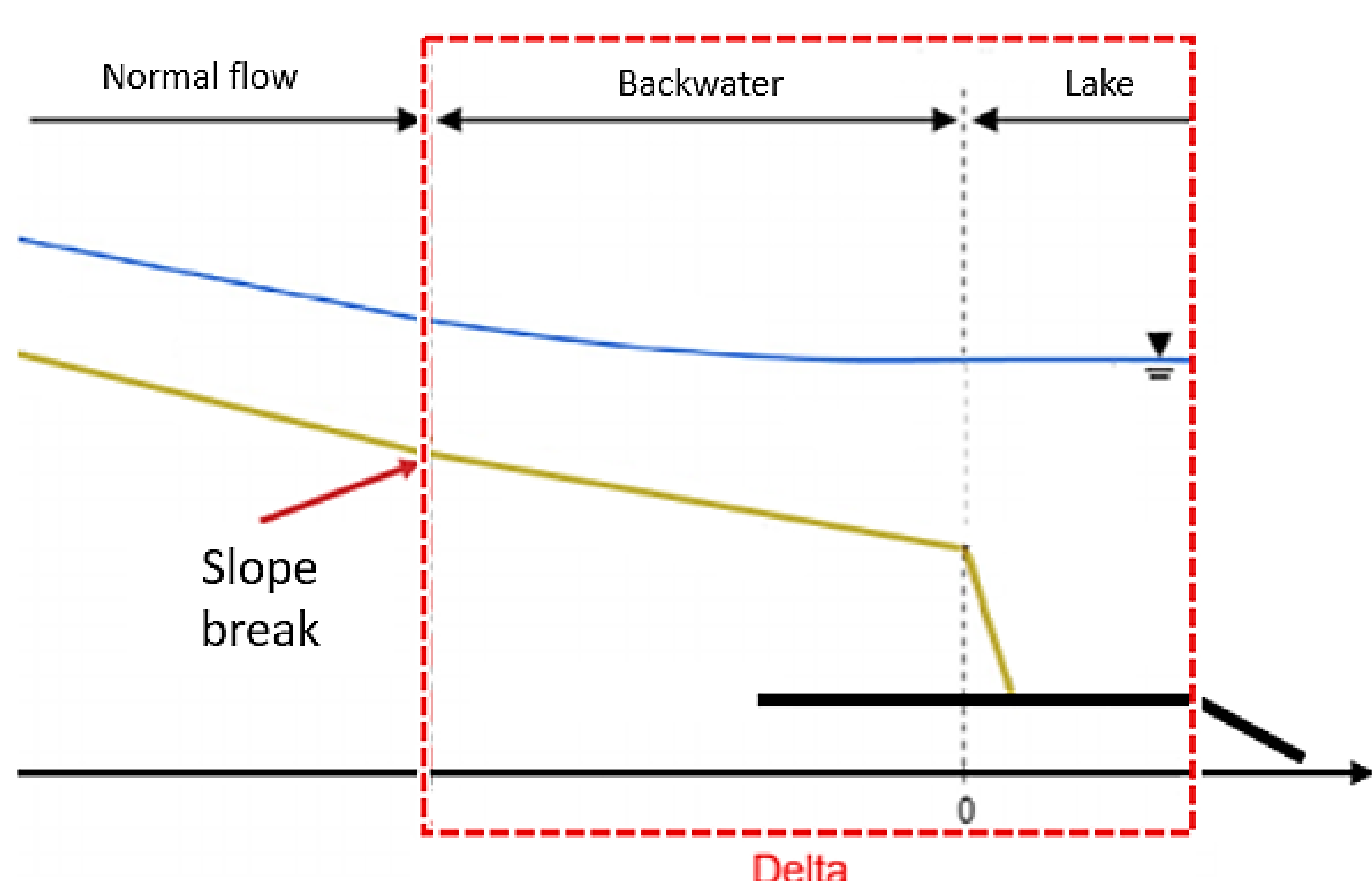


River mouth revitalization design, how to improve ecosystem services and environmental benefits of engineering work?

Renaturation des deltas lacustres : Quelle méthodologie adopter pour améliorer les services écosystémiques et bénéfices environnementaux ?

What is a lacustrine delta ?

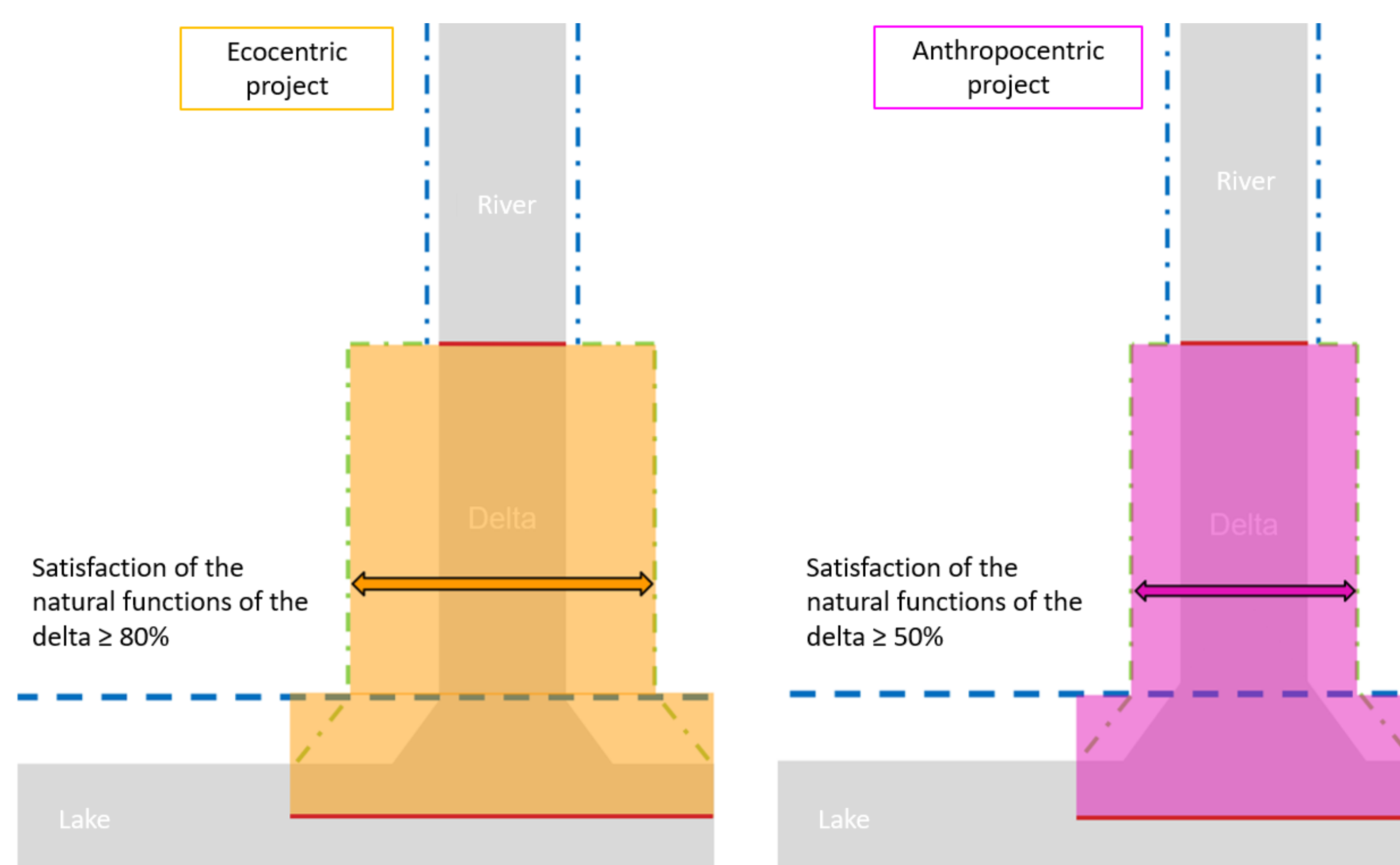
The delta is the part of the river under the hydraulic influence of the lake. It is marked by a break in the slope of the riverbed and a backwater into the stream.



Delineation of delta space on a longitudinal profile, adapted from Wu et al, 2019.

Delineation of the required space of the delta

- Distinguish between renaturation projects according to their issues
 - Ecocentric (maintenance of natural functions).
 - Anthropocentric (safety issues).
- Width of the mobility space allocated to the stream defined with « Outil Grand Cours d'Eaux » developed by the « Service Conseil Zone Alluviale ».
- Lake extent of the delta set at 100m to limit disturbance to wildlife (based on escape distance).
- Space given to the delta to fulfill a percentage of its natural functions.



Representation of the width needed for the delta to perform a % of its natural functions.

What are the natural function of the delta ?

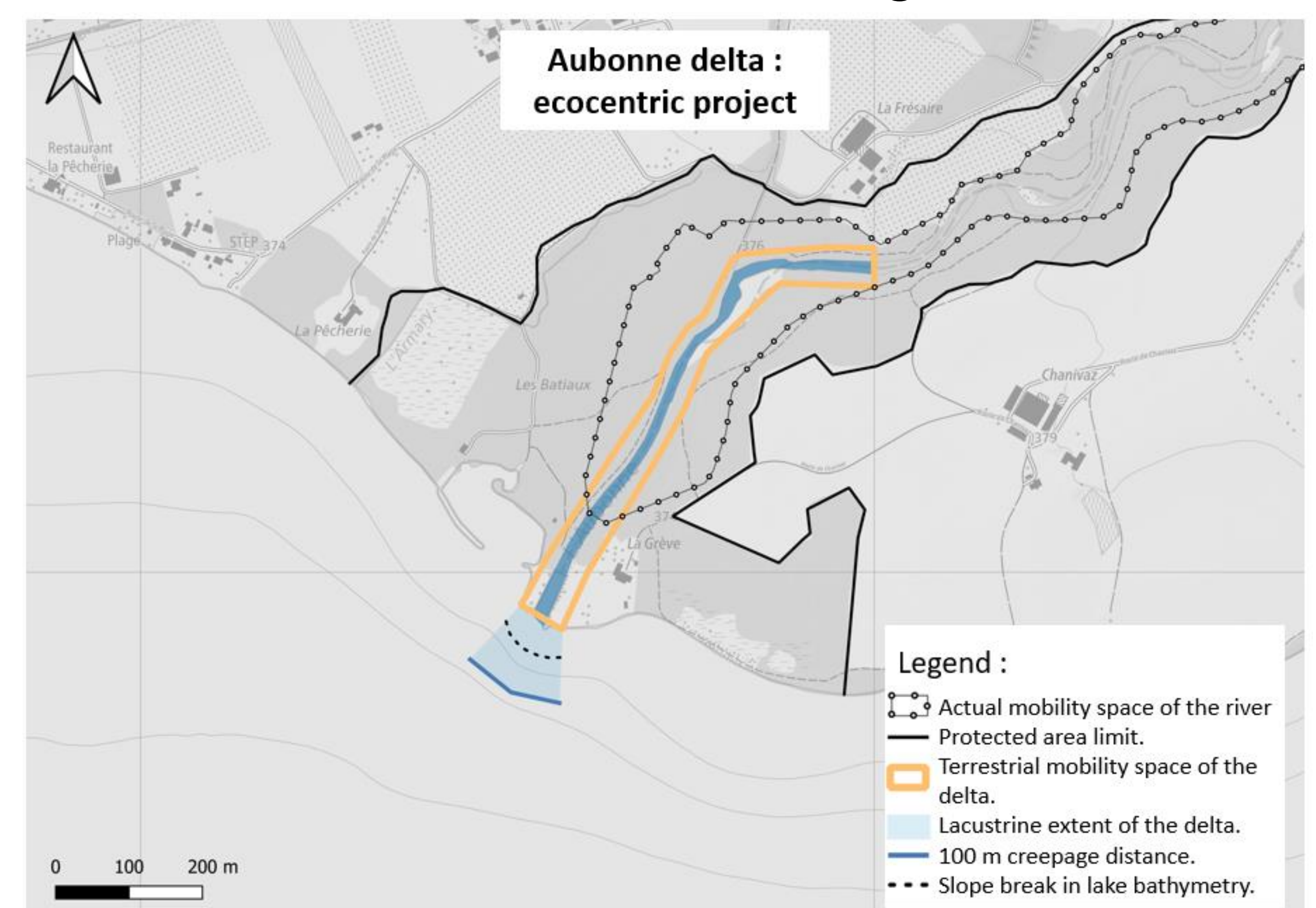
Three groups natural functions : aquatic, amphibious and terrestrial.

	80%	50%
Aquatic	Water and sediment transport	Water and sediment transport
	Longitudinal continuity	Longitudinal continuity
	Structural diversity of riverbed	Structural diversity of riverbed
	Typical fauna and flora	Typical fauna and flora
	Self-purification	Self-purification
Amphibious	Lateral connectivity	Lateral connectivity
	Groundwater recharge	Groundwater recharge
	Structural diversity of river banks	Structural diversity of river banks
Terrestrial	Buffering effect	Buffering effect
	Structural diversity of the ecosystem	Structural diversity of the ecosystem
	Flood dynamics	Flood dynamics
	Typical fauna and flora	Typical fauna and flora
	Resilience	Resilience

Comparison of the satisfaction of the natural functions of a delta between an « ecocentric » (right) and « anthropocentric » (left) project adapted from « Service Conseil Zone Alluviale », 2016.

Application to a case study – Aubonne delta

- Currently: no mobility space granted to the river downstream of the delta zone. However, the river mouth is located in an alluvial zone of national importance → protected area.
- Consequence: low morphological diversity of the delta. Current satisfaction of the natural functions of the delta : 18% versus minimum goal of 80%.



Width necessary for the morphological development of the Aubonne delta.

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