EGU General Assembly 2022
GM5.2 | Geomorphic, ecological, hydrological & wood-related river restoration and management in a changing climate
Convener: Lina Polvi Sjöberg
Co-conveners: Isabella Schalko, Maciej Liro, Elizabeth Follett, Gemma Harvey

Morphological response to climatic and anthropic pressures of the Vjosa river, a reference system for river management and restoration

Marta Crivellaro[1], Livia Serrao[2], Walter Bertoldi[1,2], Simone Bizzi[3], Alfonso Vitti[2] and Guido Zolezzi[1,2]

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3 University of Padova, Department of Geosciences, Padova, Italy
Wed, 25 May 2022 | 09:39–09:45 | EGU22-9135

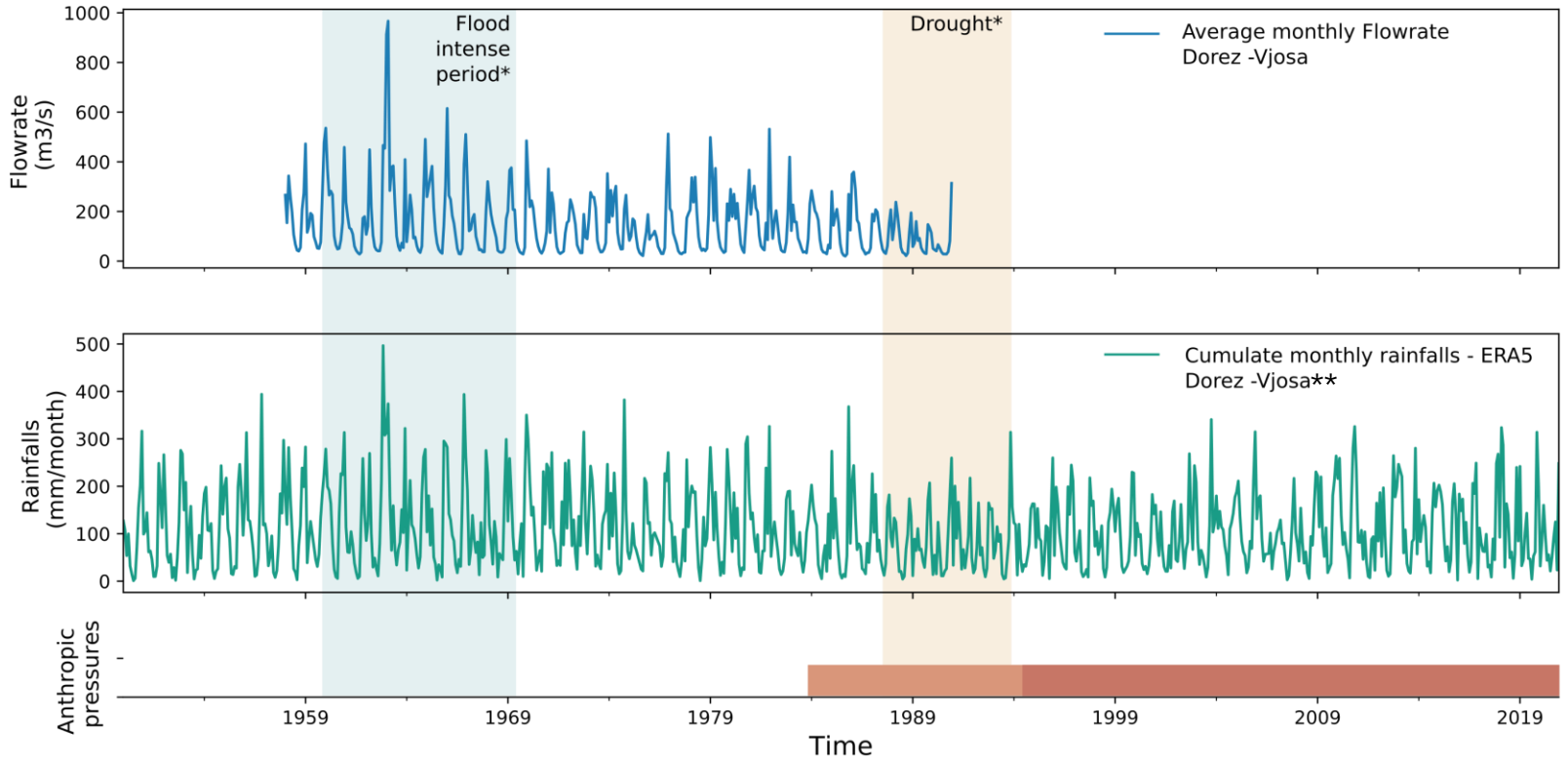
Near-Natural Rivers as reference systems to investigate river sensitivity in a changing climate

The Vjosa river near Tepelene, Albania, September 2019

Climatic variations shaping river morphodynamics

Research Hypothesis:

Recent morphological trajectories of the Vjosa river system represent system's diverse response to regional climatic fluctuations and localized anthropic pressures.



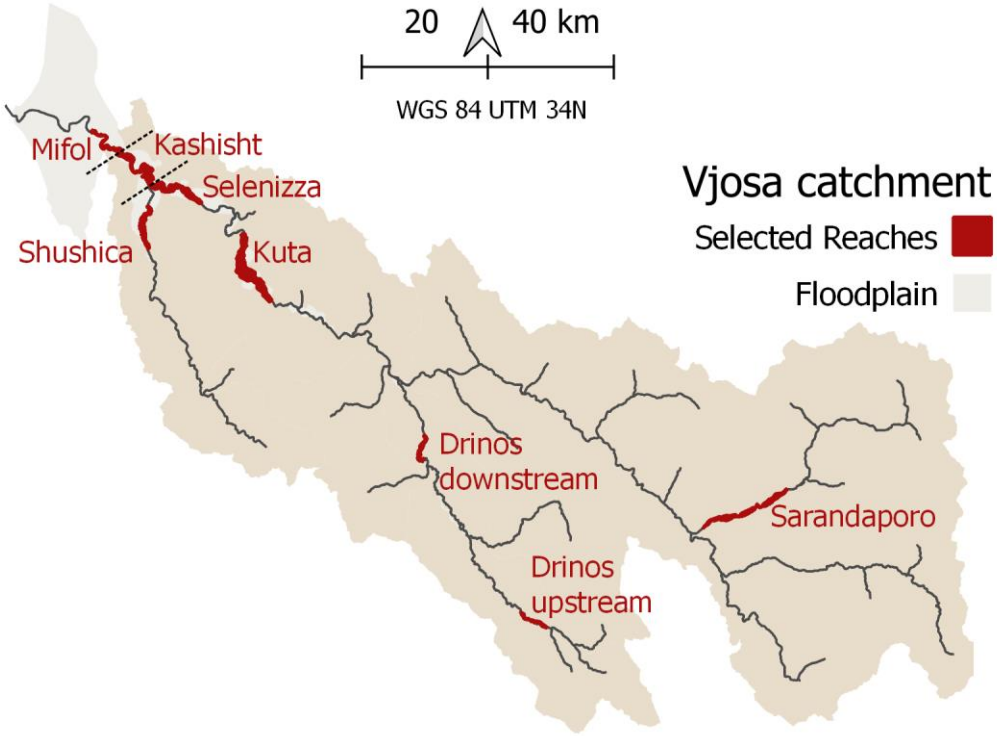
Climatic variations & Anthropic pressures → River morphodynamics?

* Skoulikidis et al. 2022, ** Hersbach et al., 2018, Bell et al., 2021

Methods

Channel adjustments over the past 50 years

- *USGS 1968 Declassified Corona images;*
- *Landsat 5/7/8 images – 1985-2020;*
- *Google Earth Engine cloud analysis;*
- *8 selected river reaches.*



Analysis of drivers of change at the catchment and reach scale

- *Hydrological analysis;*
- *Anthropic pressures assessment*

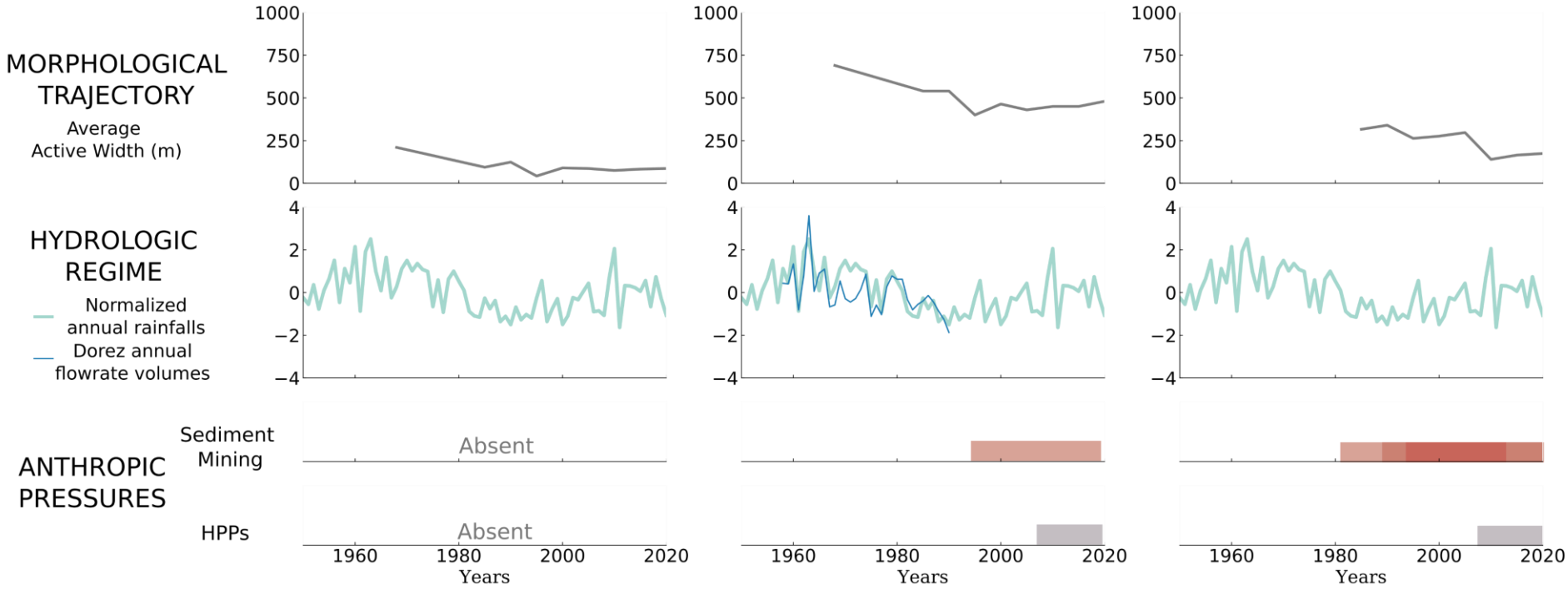
(land cover, sediment mining, HPPs).

Results

Drinos upstream
Partially confined transitional reach
L* =6,3 km ; i_F*= 1,7 m/km

Kuta
Partially confined braided reach
L* =13,5 km; i_F= 1,8 m/km

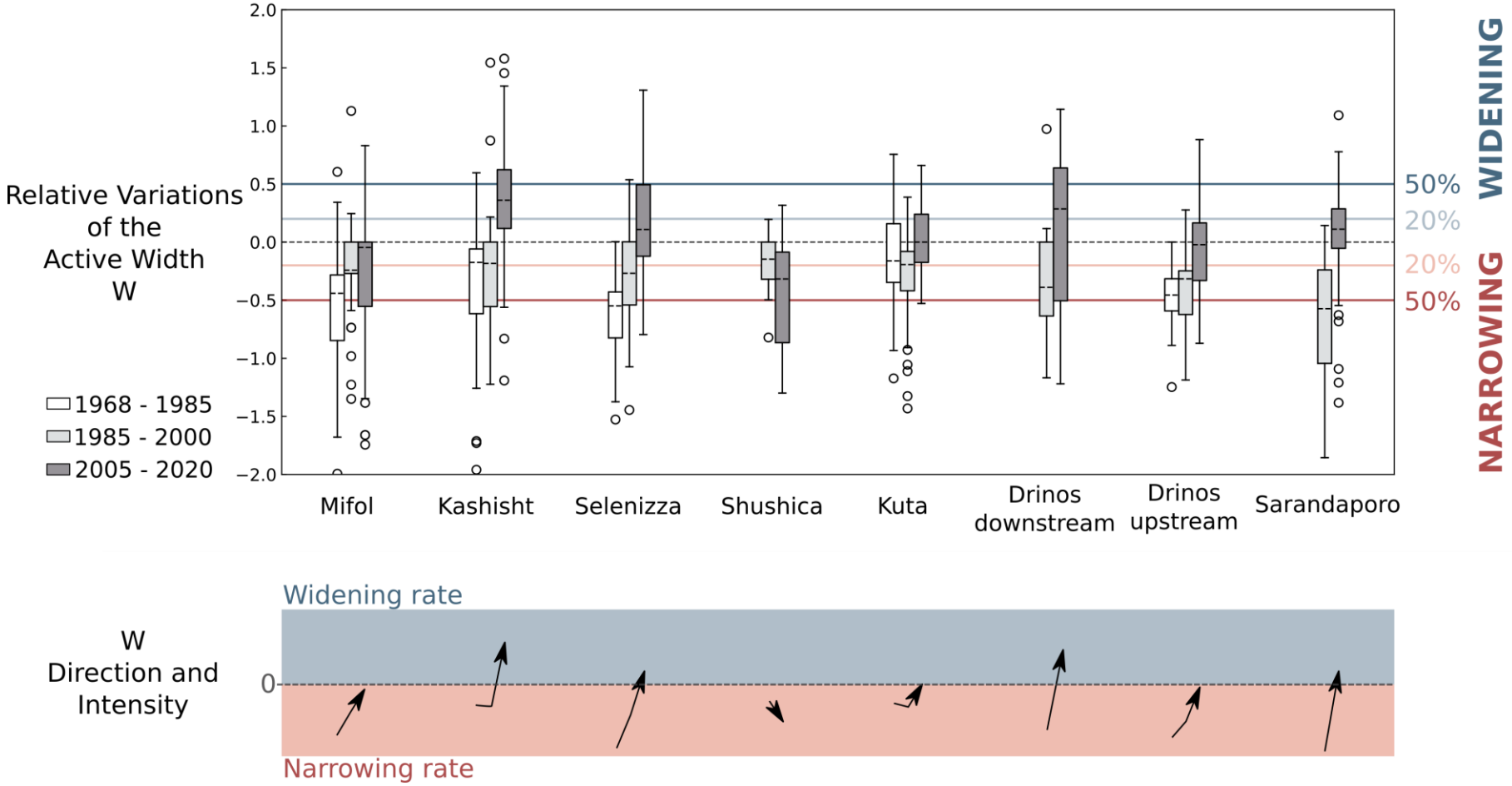
Shushica
Partially confined braided reach
L* =8,1 km; i_F= 2,5 m/km



Increasing Anthropic Pressures

L*: reach lenght, i_F* : reach average slope

Results


Relative Variations of the Active Width W
1968 - 1985
1985 - 2000
2005 - 2020
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
50%
20%
20%
50%
WIDENING
NARROWING
Mifol
Kashisht
Selenizza
Shushica
Kuta
Drinos downstream
Drinos upstream
Sarandaporo
W Direction and Intensity
Widening rate
0
Narrowing rate

Conclusions

- **Catchment scale**: System time-to-recovery from the flood intense period (decreasing narrowing rates);

- **Reach scale**: important impact of sediment mining on evolutionary trajectory;

The study supports **geomorphic sensitivity assessment** for the Near-Natural Vjosa river. Main implications:

→Support for future management of the Vjosa;

→Reference analysis to support restoration of other regulated rivers.

The Vjosa river near Tepelene, Albania, September 2019

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