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Modelling macroinvertebrate microhabitat selection for e flow assessment

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► To cite this version:

Maxence Forcellini, Laura Plichard, Sylvain Dolédec, Sylvie Mériçoux, Jean-Michel Olivier, et al.. Modelling macroinvertebrate microhabitat selection for e flow assessment. 4. Conférence internationale I.S.Rivers "Recherches et actions au service des fleuves et grandes rivières", Jul 2022, Lyon, France. . hal-03794973

HAL Id: hal-03794973

<https://hal.science/hal-03794973v1>

Submitted on 5 Oct 2022

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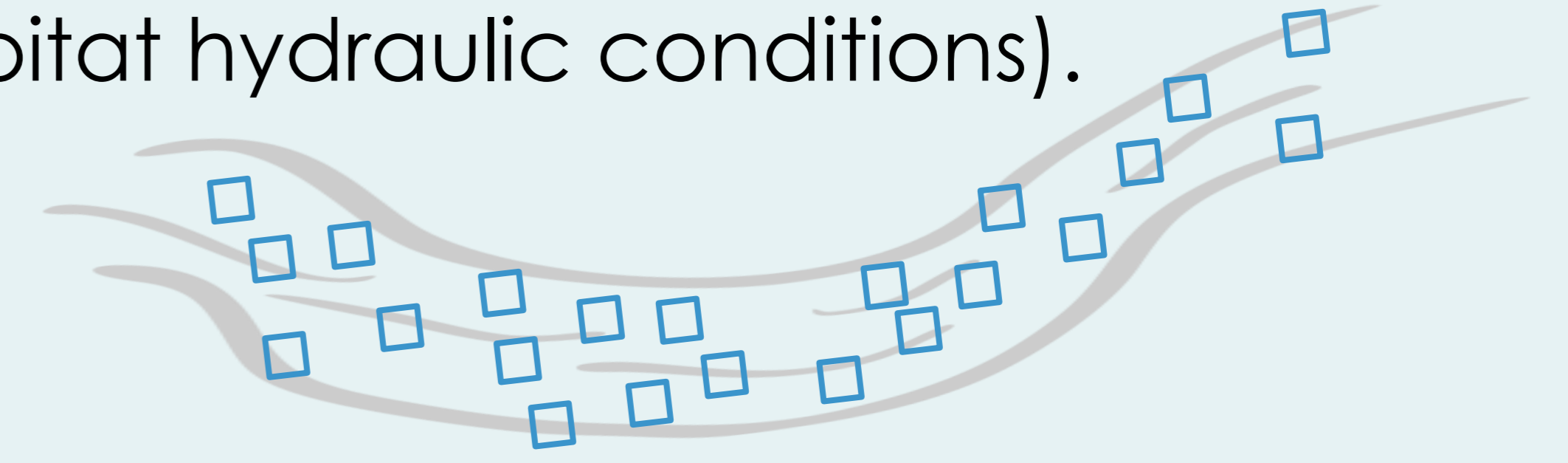
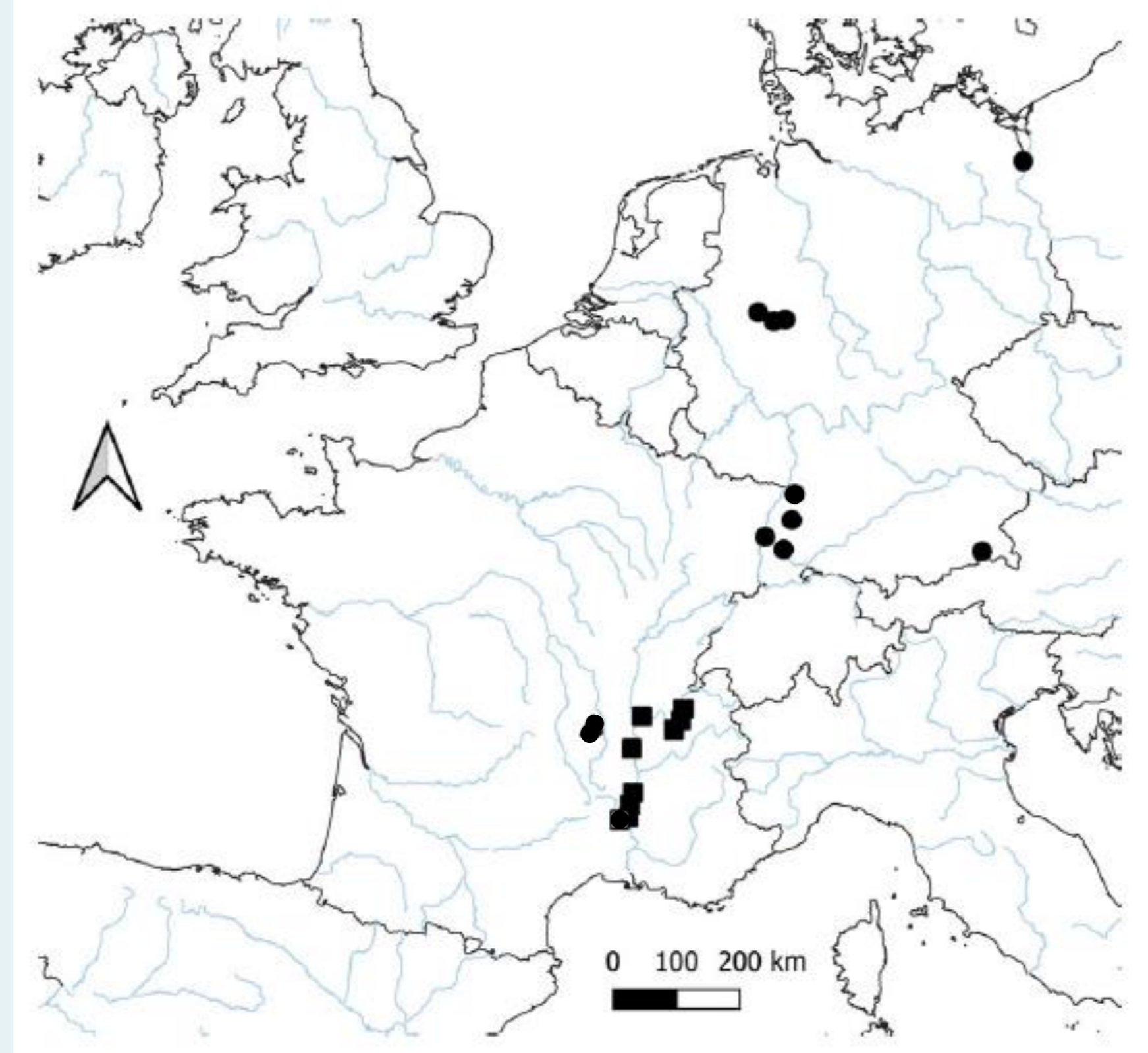
Modelling macroinvertebrate microhabitat selection for e-flow assessment

selection for e-flow assessment

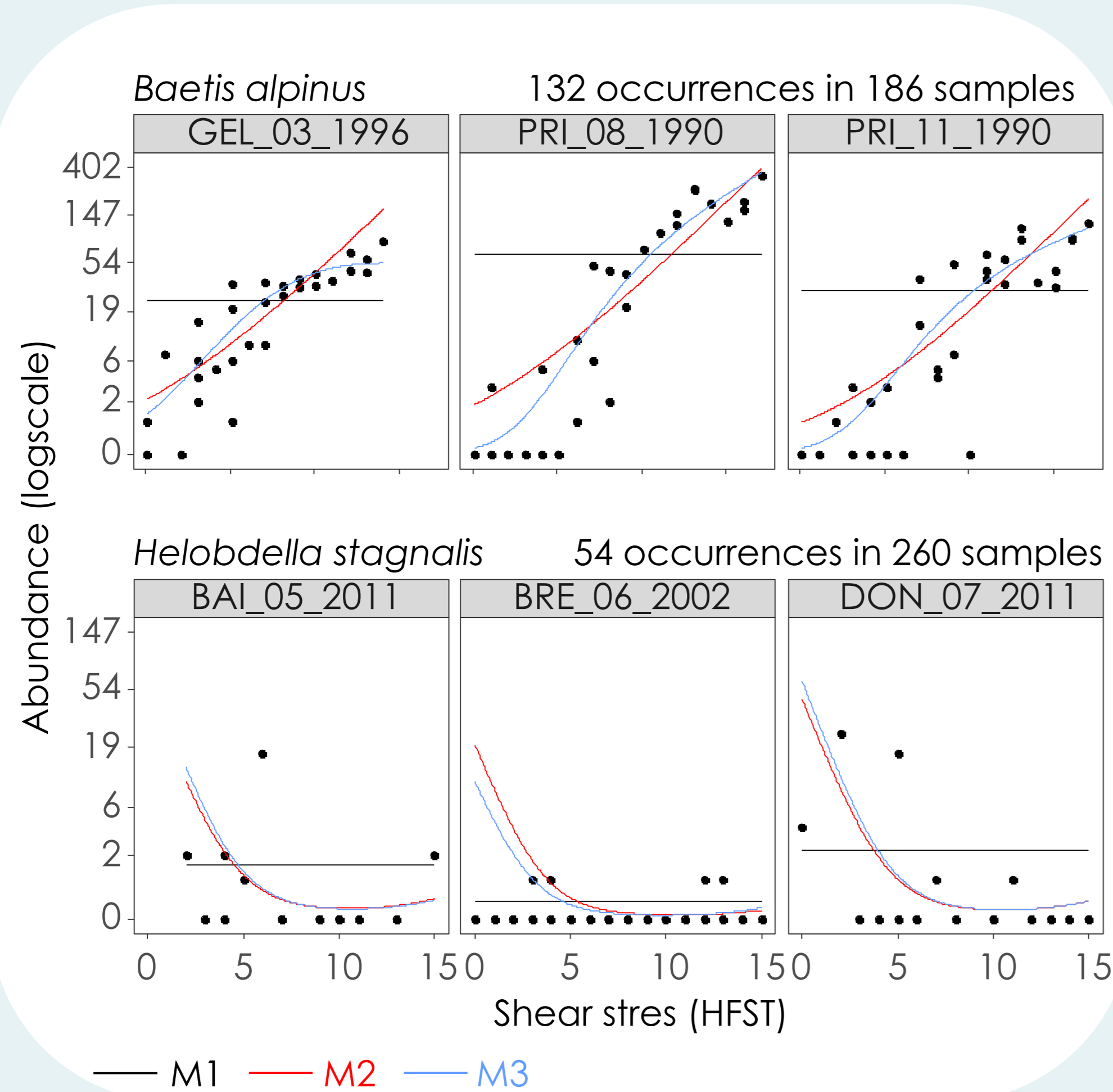
Among e-flow assessment methods, hydraulic habitat models predict changes in habitat suitability for aquatic species under different flow scenarios, combining hydraulic models (predicting microhabitat hydraulic conditions at various discharges) with biological models of microhabitat selection (predicting species abundances at various microhabitat hydraulic conditions).

Objectives:

1. update macroinvertebrate microhabitat models
2. quantify their transferability
3. compare hydraulic predictors

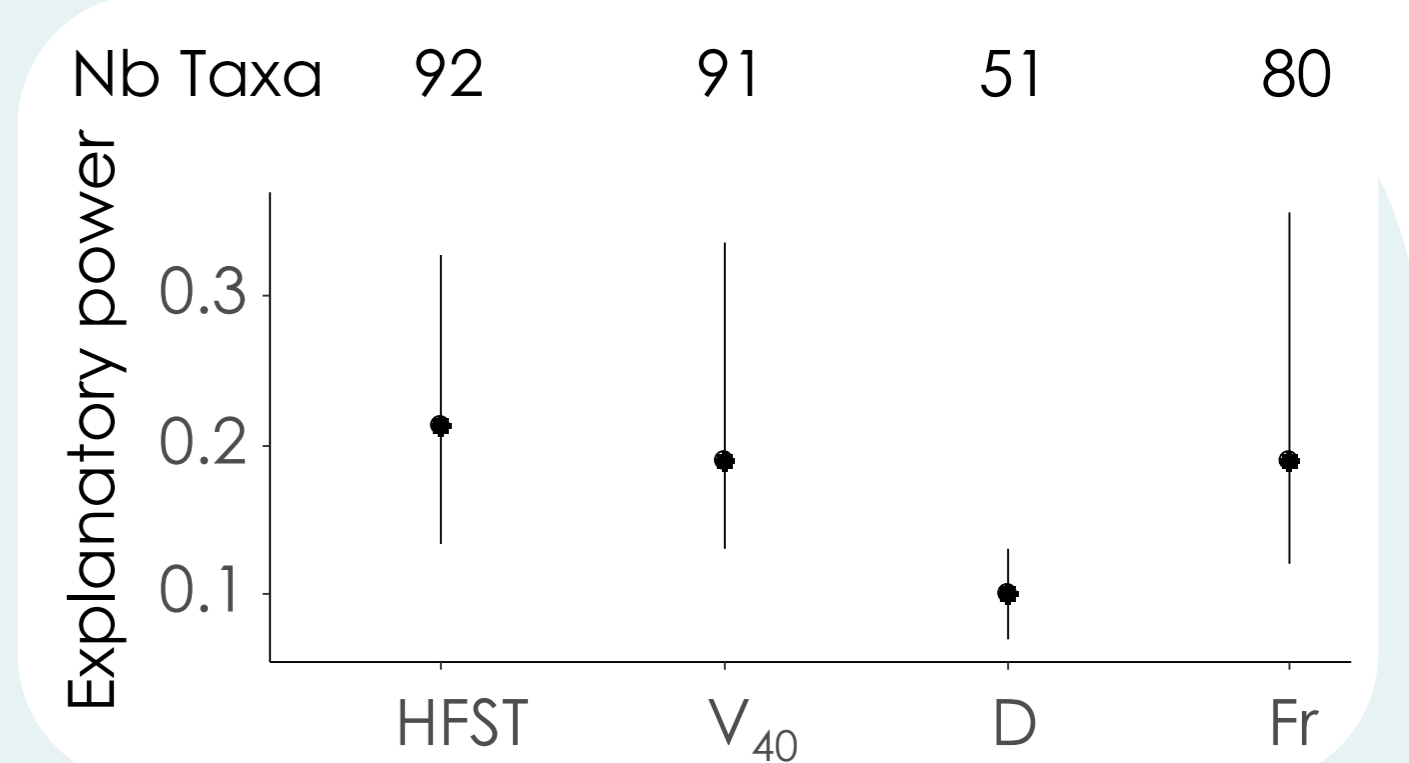


Hydraulic predictors: shear stress (HFST), flow velocity (V_{40}), depth (D), Froude ($Fr = V_{40} \sqrt{gD}$)

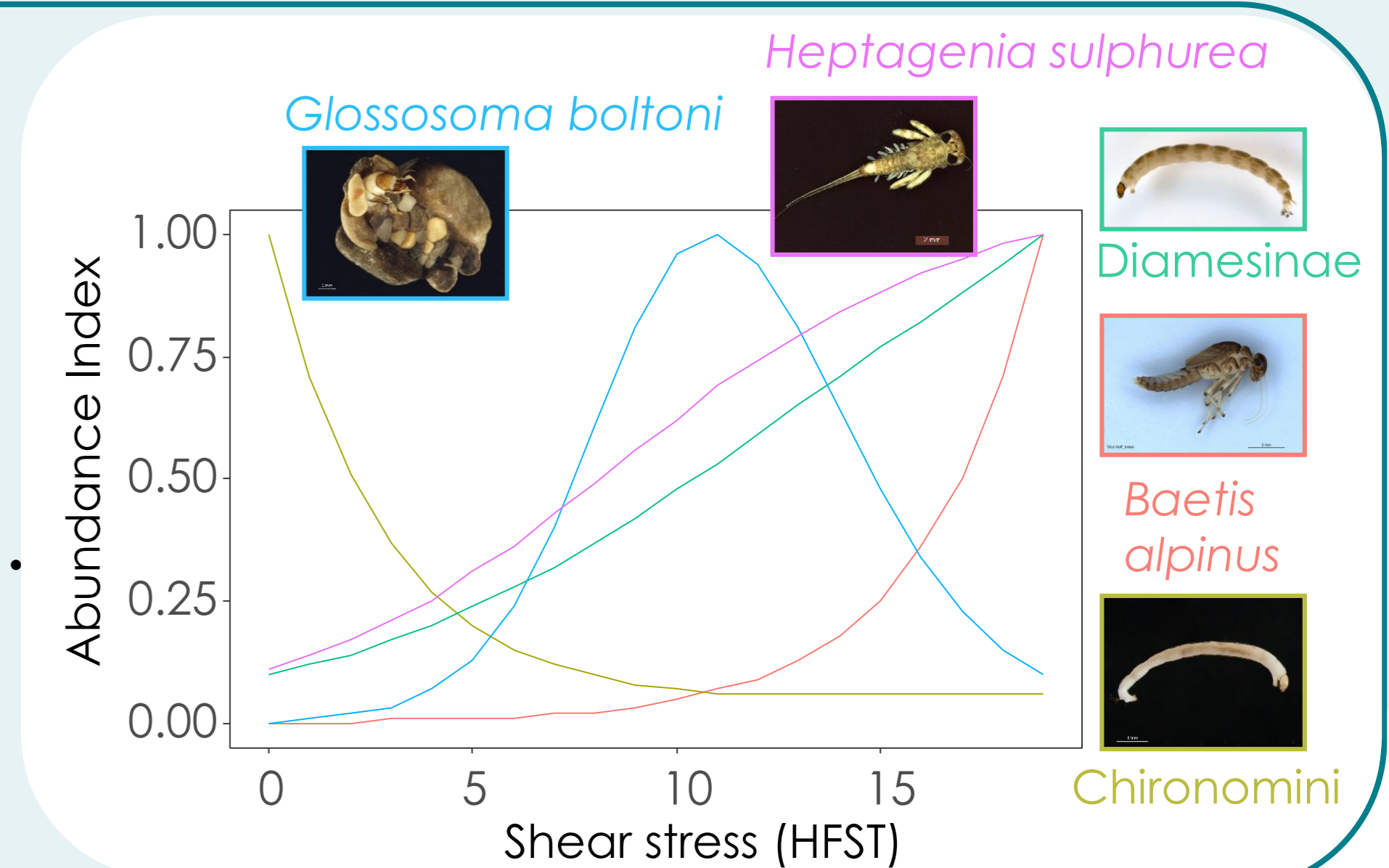


- Microhabitat selection models
- M1 → no microhabitat selection
 - M2 → 'average' microhabitat selection
 - M3 → 'by survey' microhabitat selection

- Among 258 taxa sampled,
- 78 % with significant hydraulic response (M3)
 - 72 % with relevant transferability (M2)

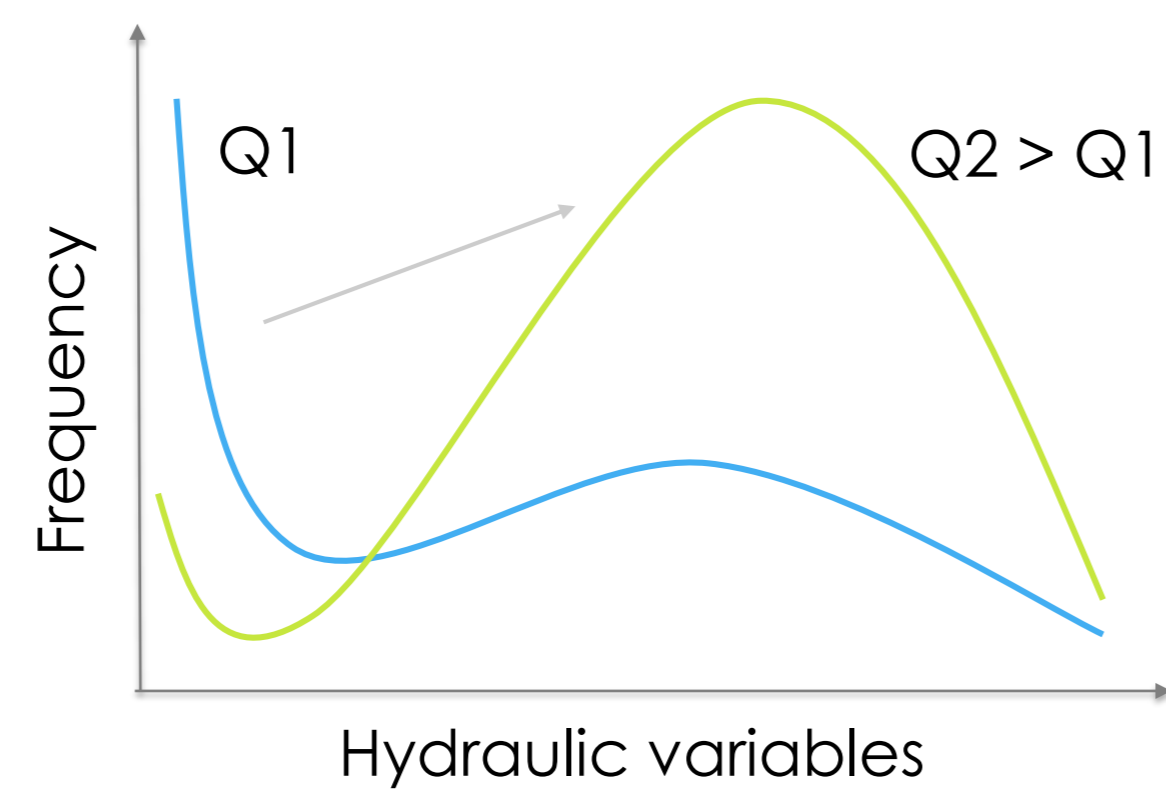


- 144 NEW macroinvertebrate microhabitat selection models
- New adaption in alpine (often fishless) streams (Becquet et al. in review)



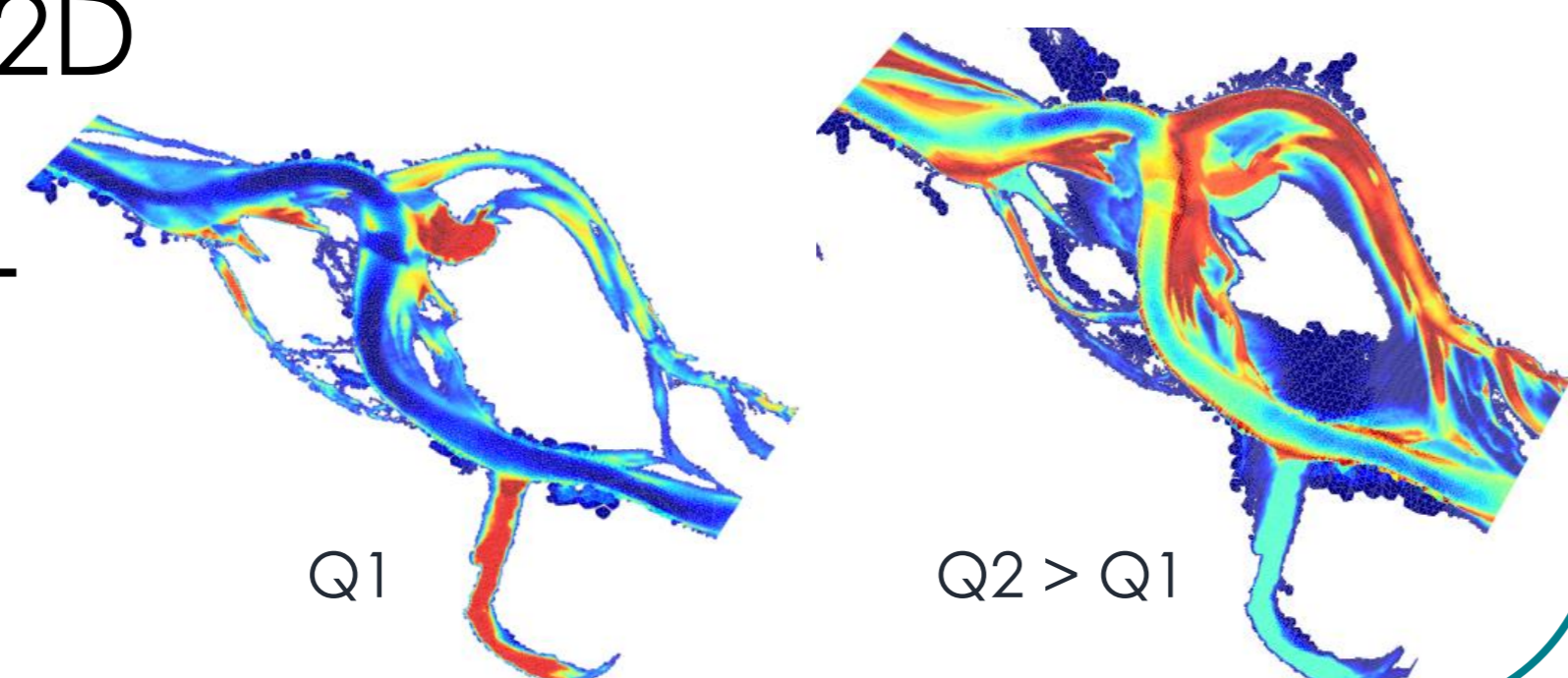
Statistical hydraulic Models

Stathab
Stathab-steep
FSTress
Estimhab



Numerical hydraulic Models

HEC-RAS 1D /2D
TELEMAC 2D
RUBAR 2D
BASEMENT
LAMMI



HABBY

A new Open-Source Software to Estimate hydraulic HABitat SuitabilityY

<https://habby.wiki.inrae.fr/>

Habitat Suitability index

