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## Modelling macroinvertebrate microhabitat selection for e flow assessment

Maxence Forcellini, Laura Plichard, Sylvain Dolédec, Sylvie Mériçoux,  
Jean-Michel Olivier, Sophie Cauvy-Fraunié, Juliette Becquet, Nicolas  
Lamouroux, Yann Lecoarer

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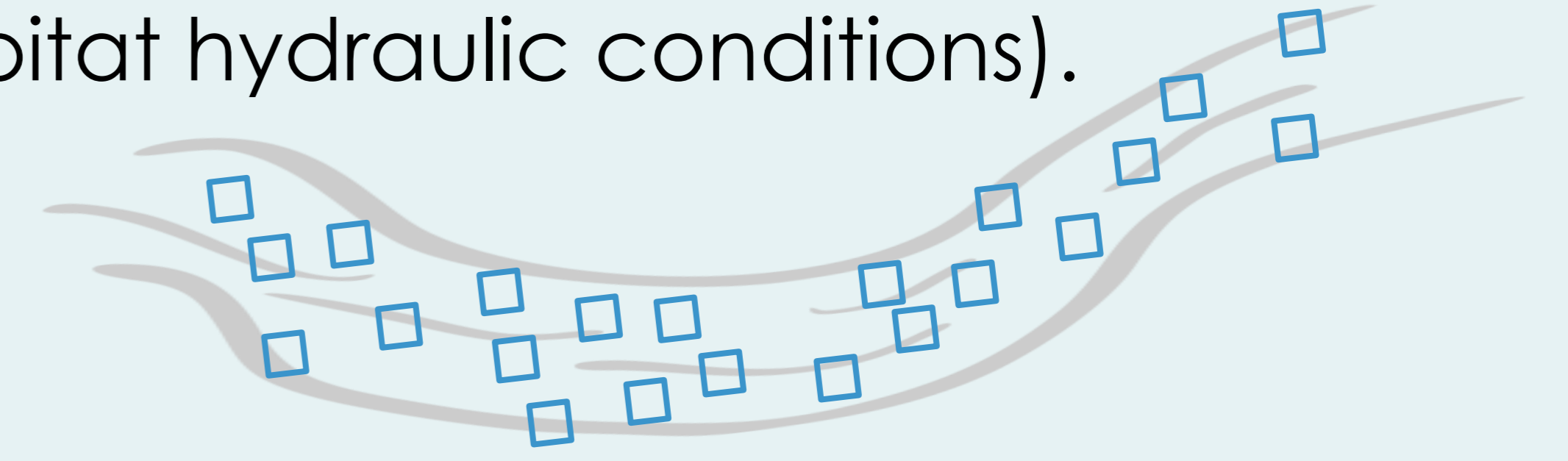
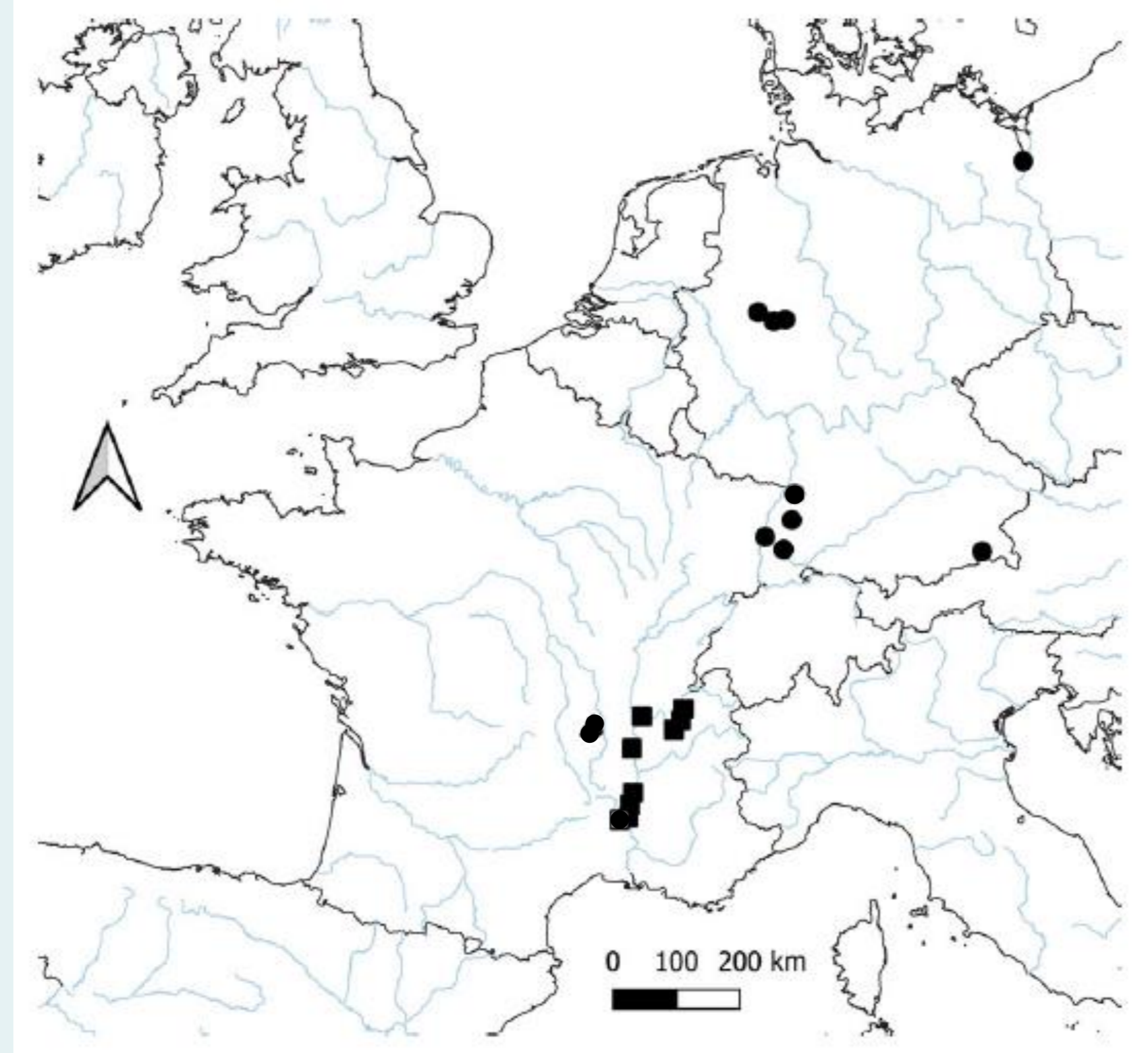
# Modelling macroinvertebrate microhabitat selection for e-flow assessment

## selection for e-flow assessment

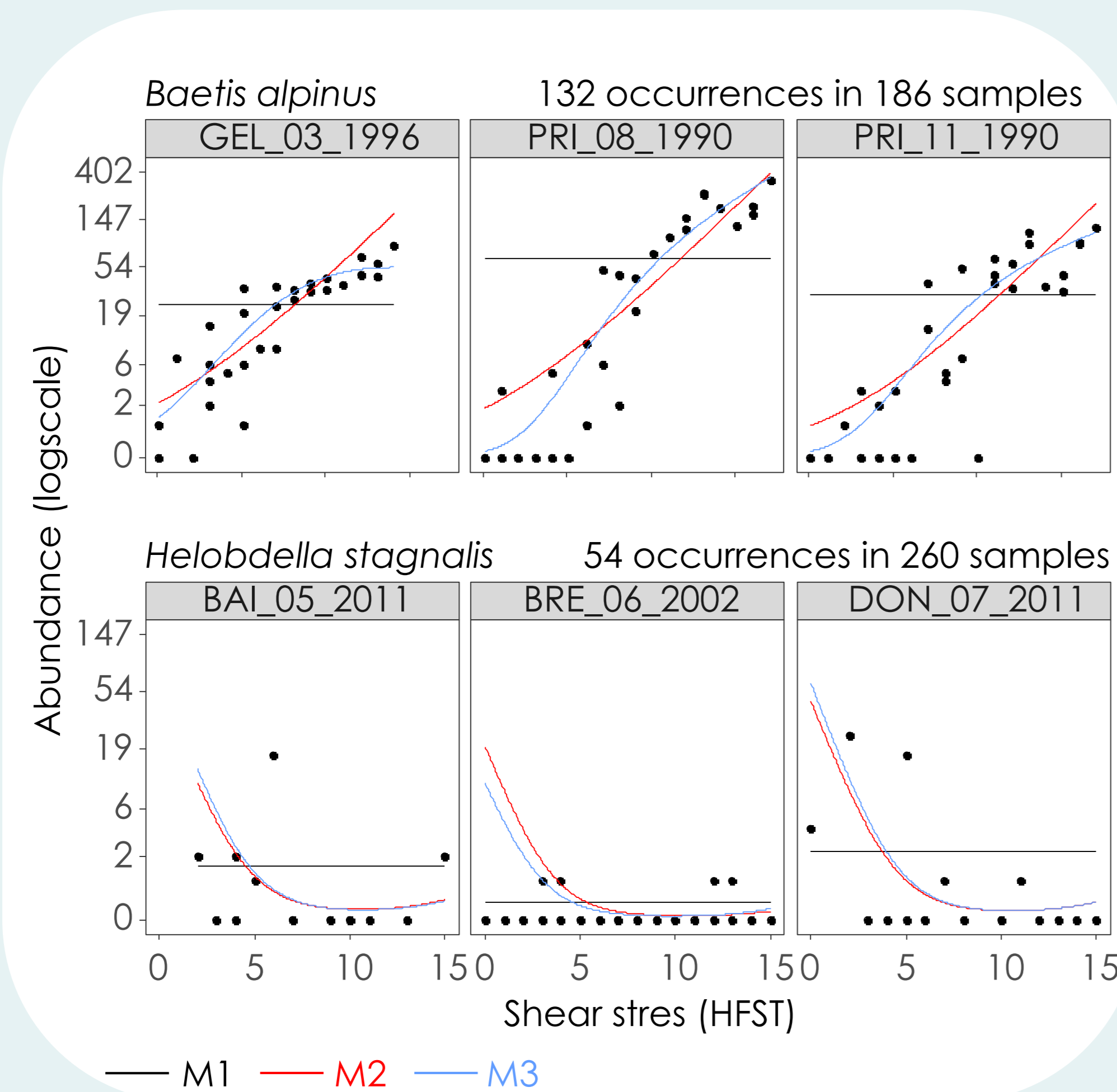
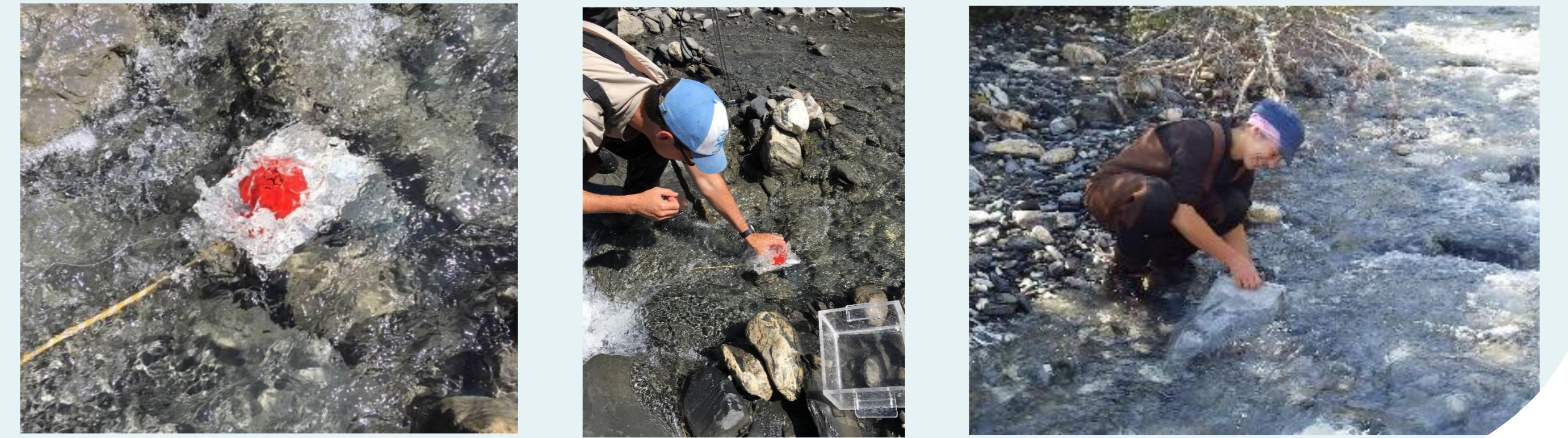
Among e-flow assessment methods, hydraulic habitat models predict changes in habitat suitability for aquatic species under different flow scenarios, combining hydraulic models (predicting microhabitat hydraulic conditions at various discharges) with biological models of microhabitat selection (predicting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

### Objectives:

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

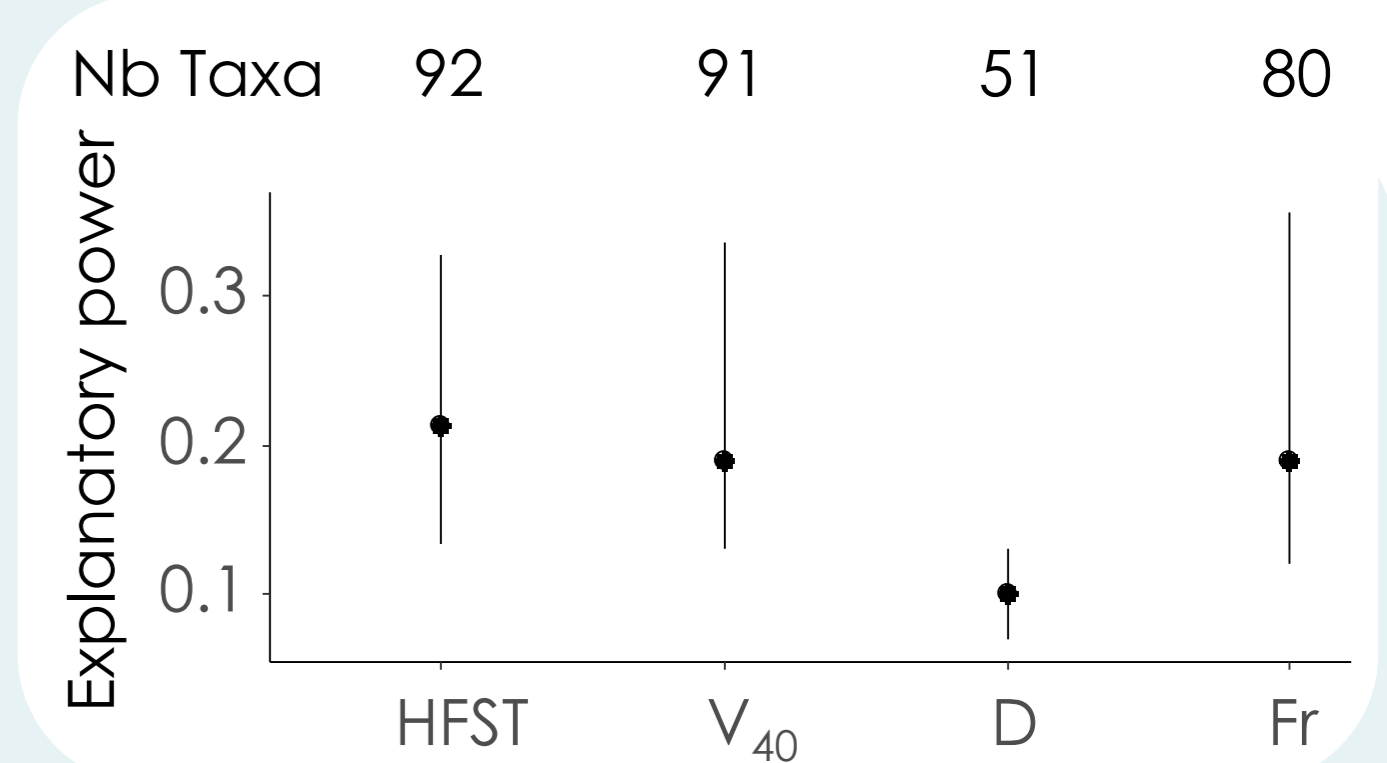


Hydraulic predictors: shear stress (HFST), flow velocity ( $V_{40}$ ), depth (D), Froude ( $Fr = V_{40} \sqrt{gD}$ )

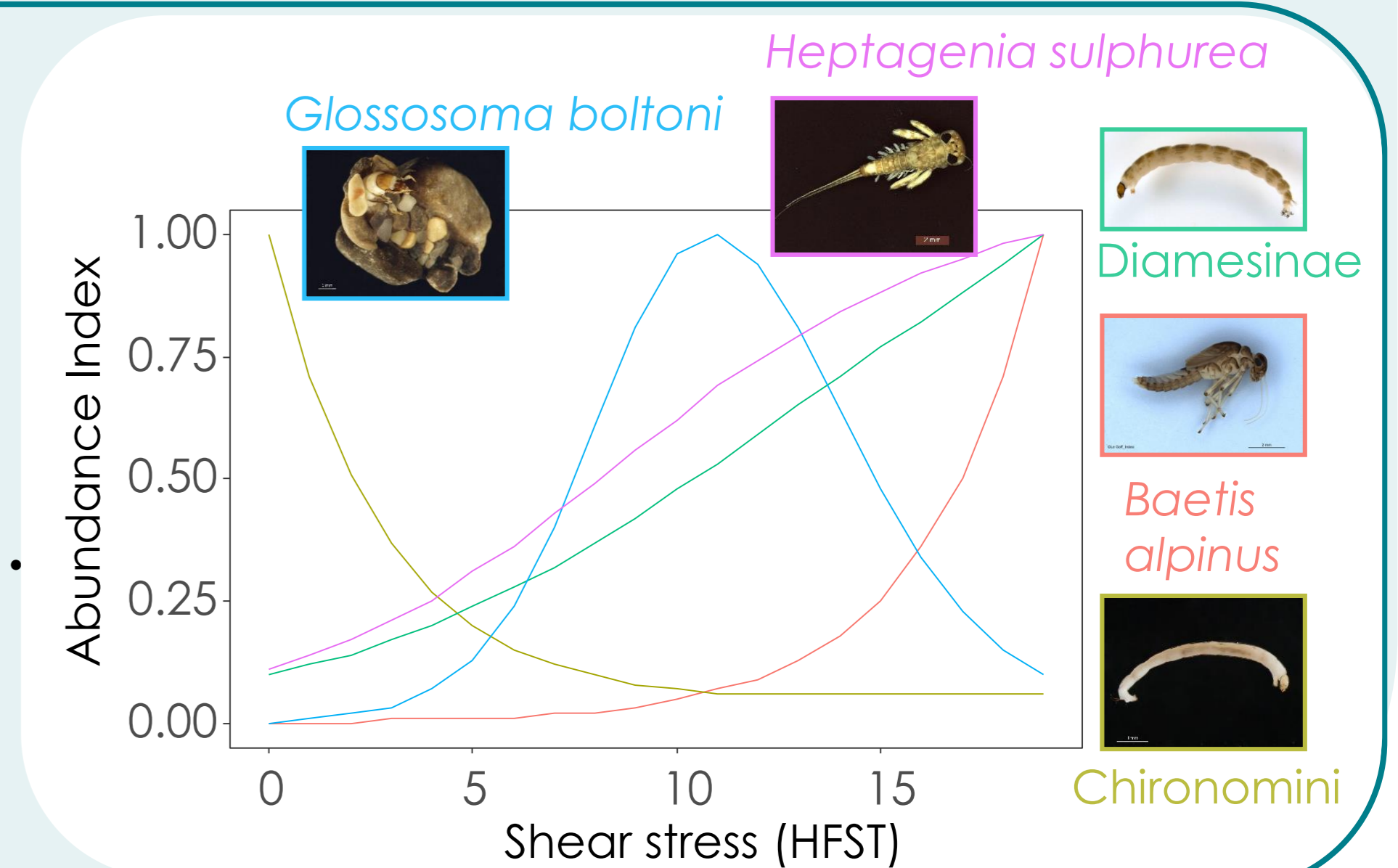


- Microhabitat selection models
- M1 → no microhabitat selection
  - M2 → 'average' microhabitat selection
  - M3 → 'by survey' microhabitat selection

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

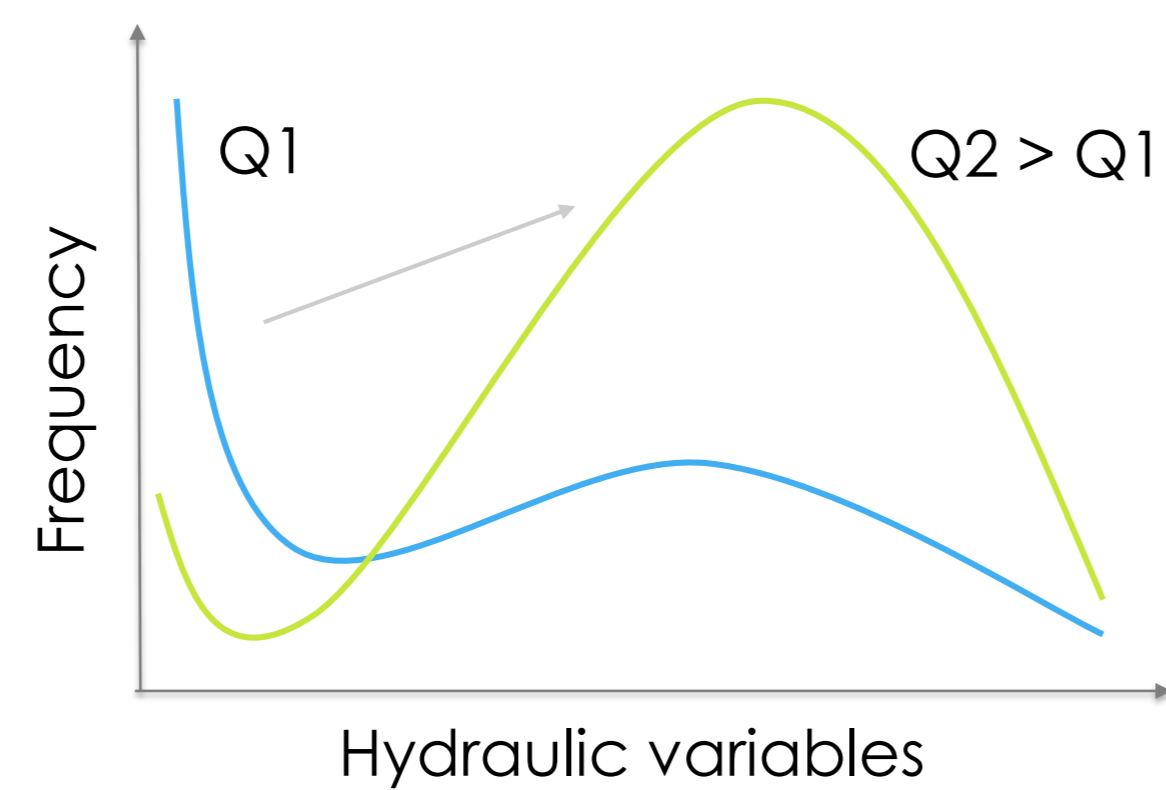


- 144 NEW macroinvertebrate microhabitat selection models
- New adaption in alpine (often fishless) streams (Becquet et al. in review)



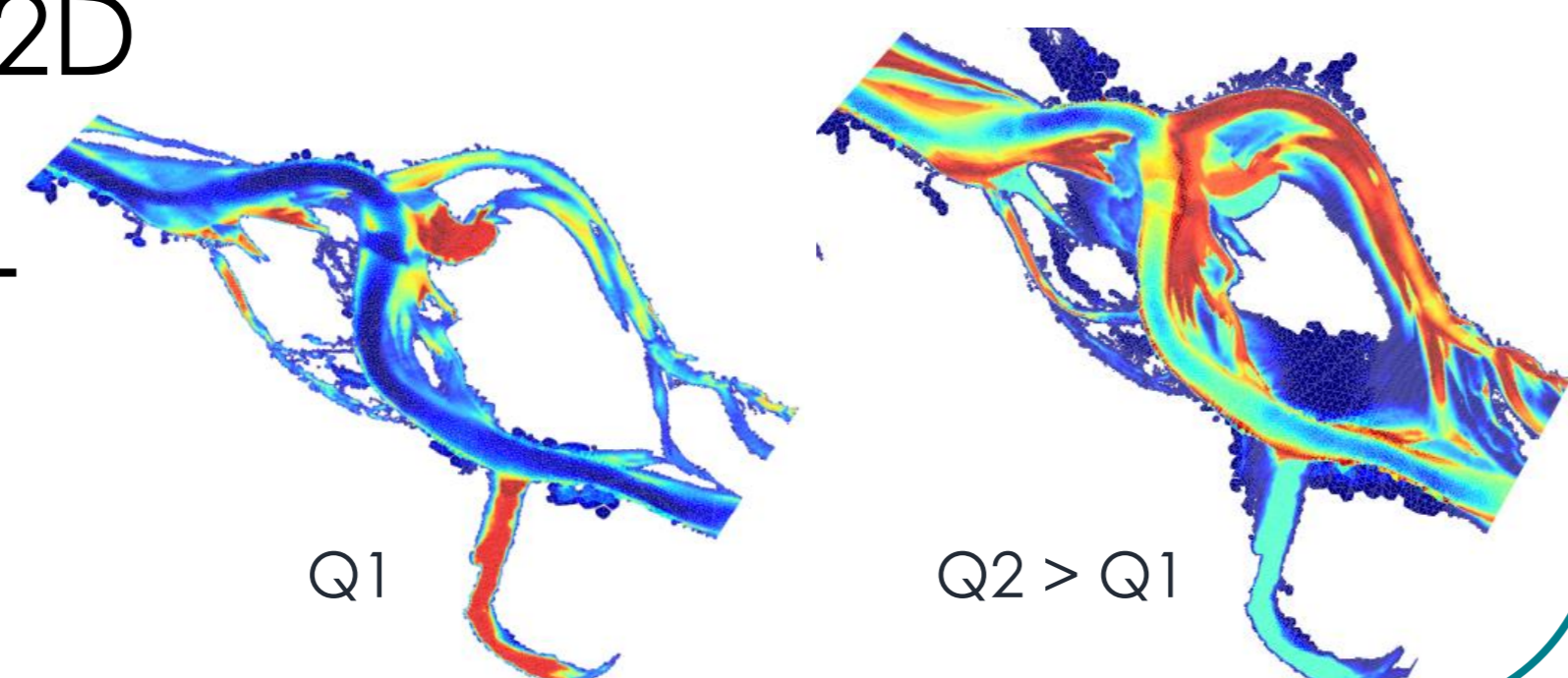
### Statistical hydraulic Models

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

