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Assessing the long-term effectiveness of channel control works and supporting watershed management through sediment dynamics studies

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# Assessing the long-term effectiveness of channel control works and supporting watershed management through sediment dynamics studies

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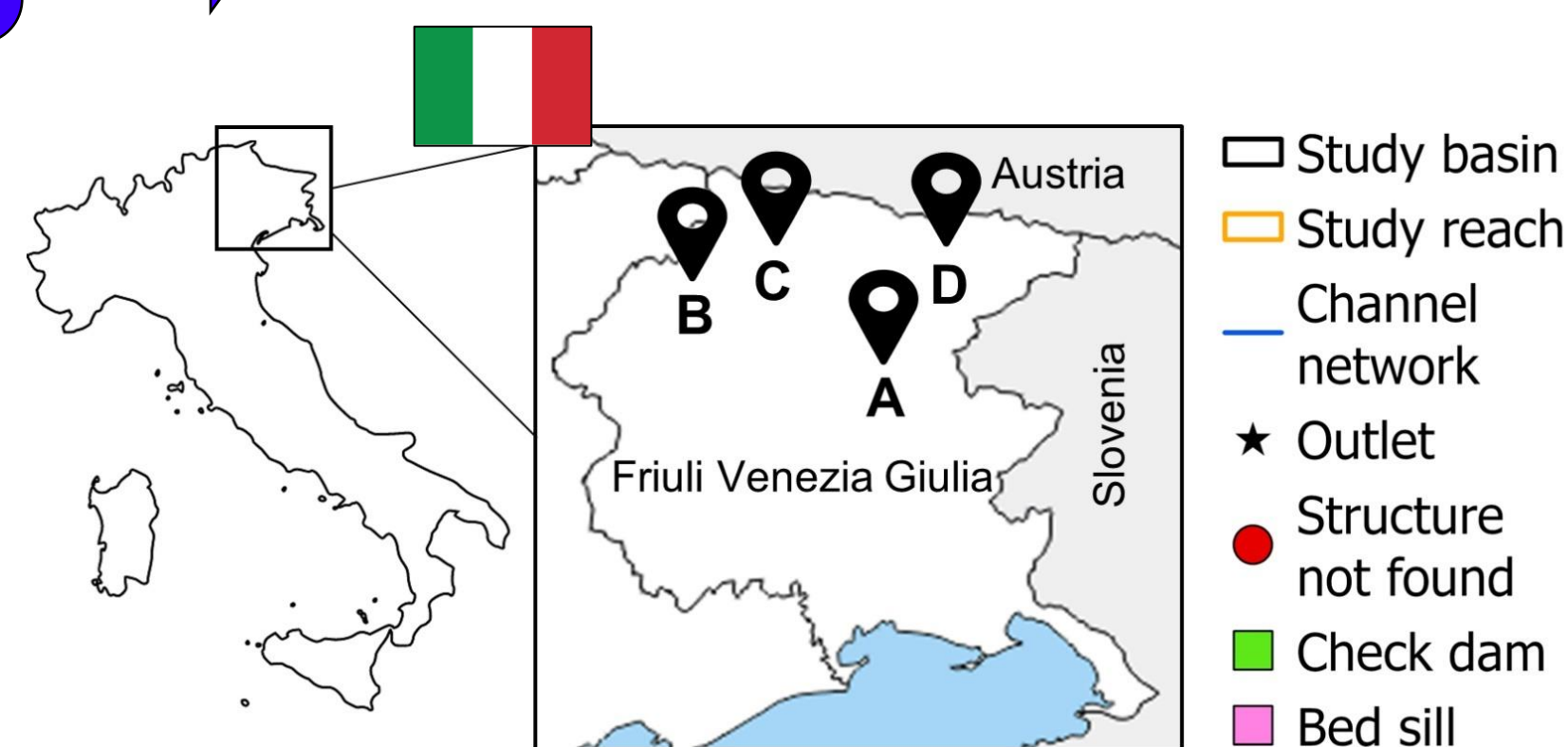
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WHY

Background  
Aim of the research

WHERE

4 mountain basins

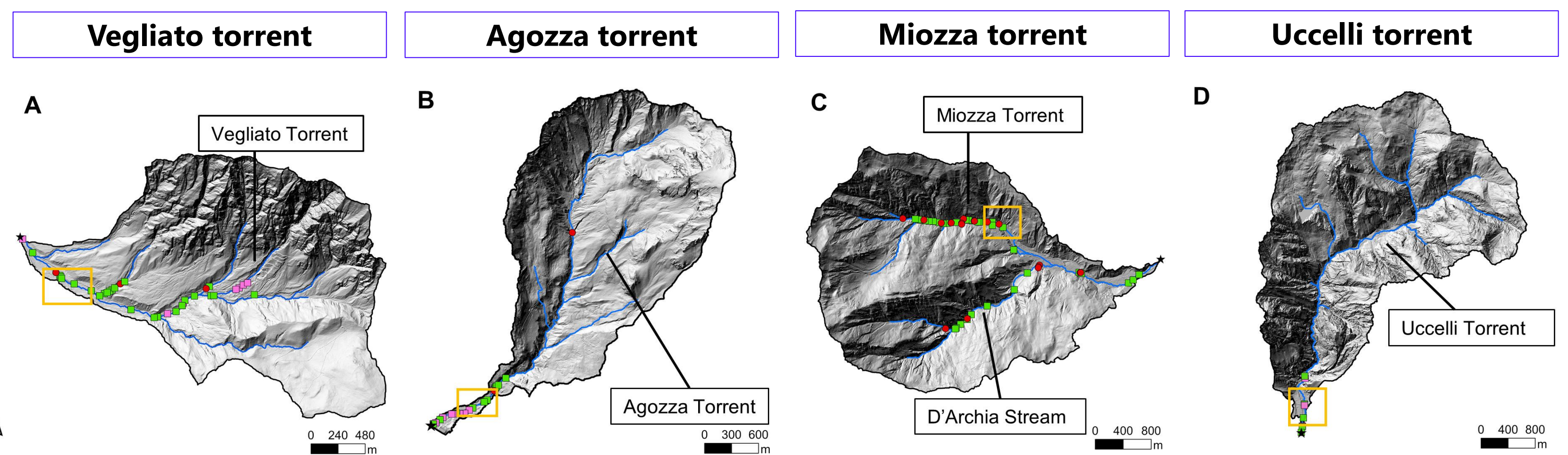


HOW

Methodological workflow

Lack of information on the **status and functionality of existing structures**, and a priori in-depth study to analyse the **sediment morphology dynamics and the interaction with existing channel control works**

To introduce a **methodological approach** that integrates **sediment morphology dynamics data** over extended time spans in some mountain catchments **with the current efficiency of existing interventions**



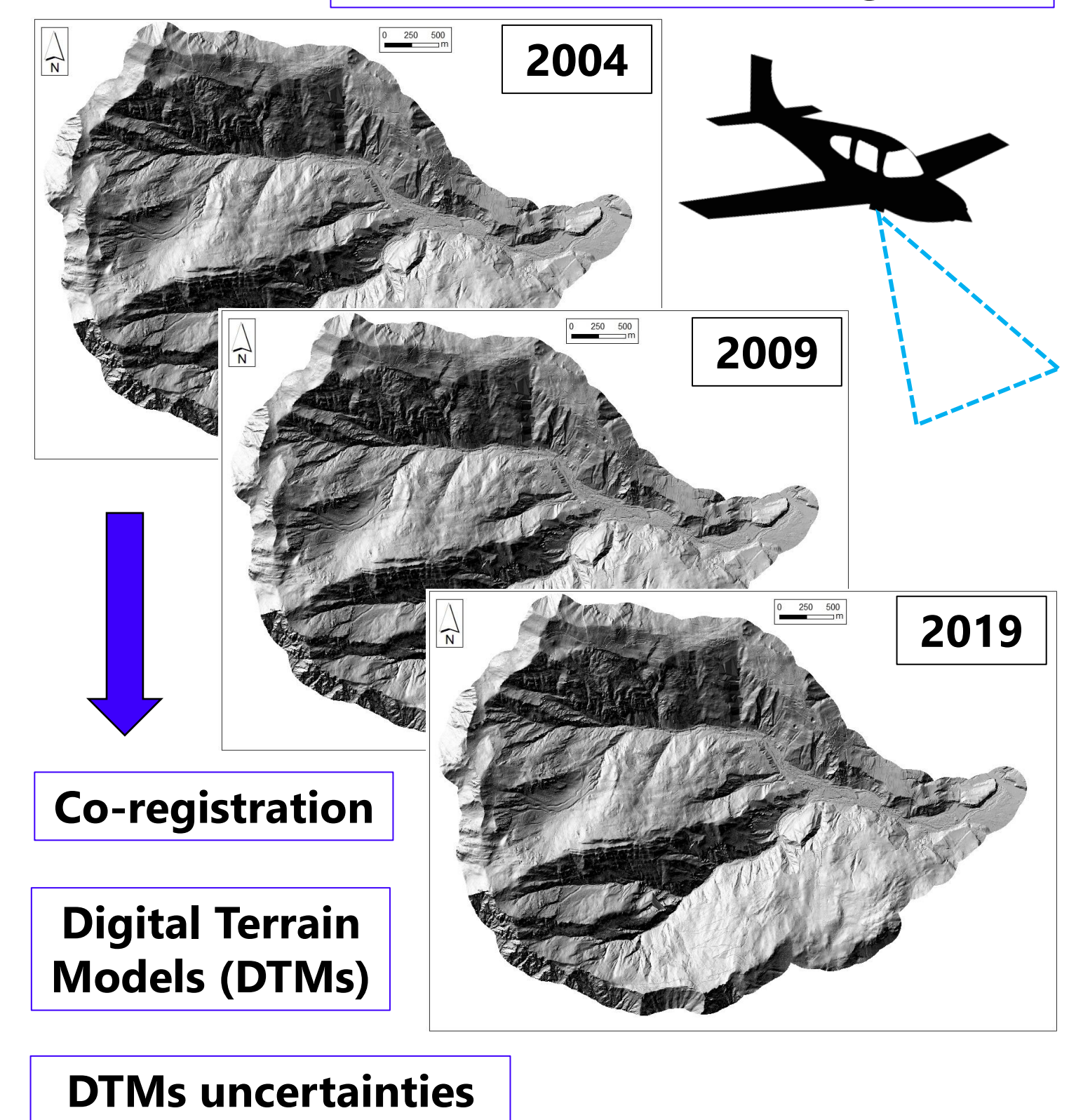
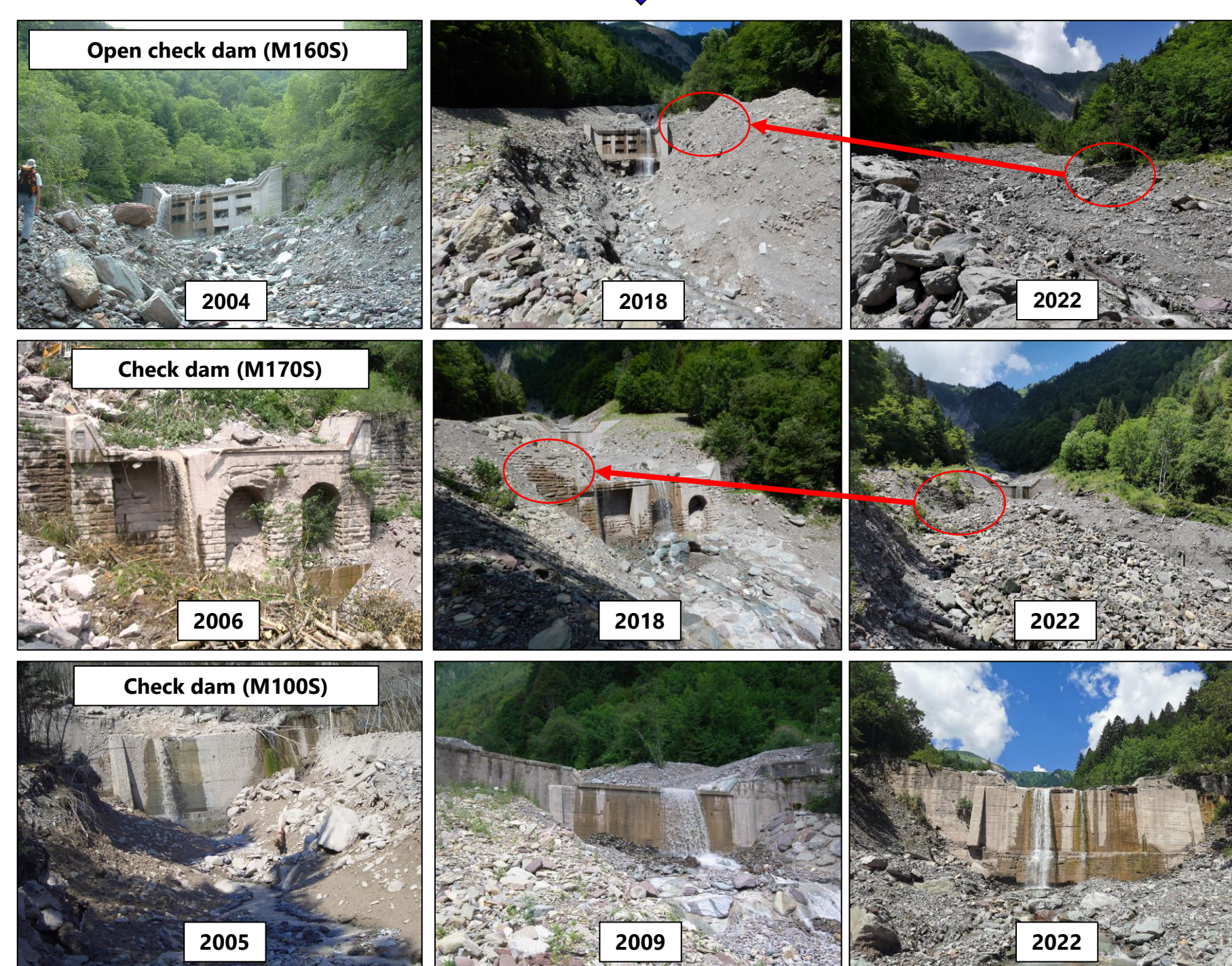
Updating of channel control work cadastre  
Type, location and measures of structures  
Status and functionality of structures

Multi-temporal topographic surveys  
Airborne Laser Scanning (ALS)

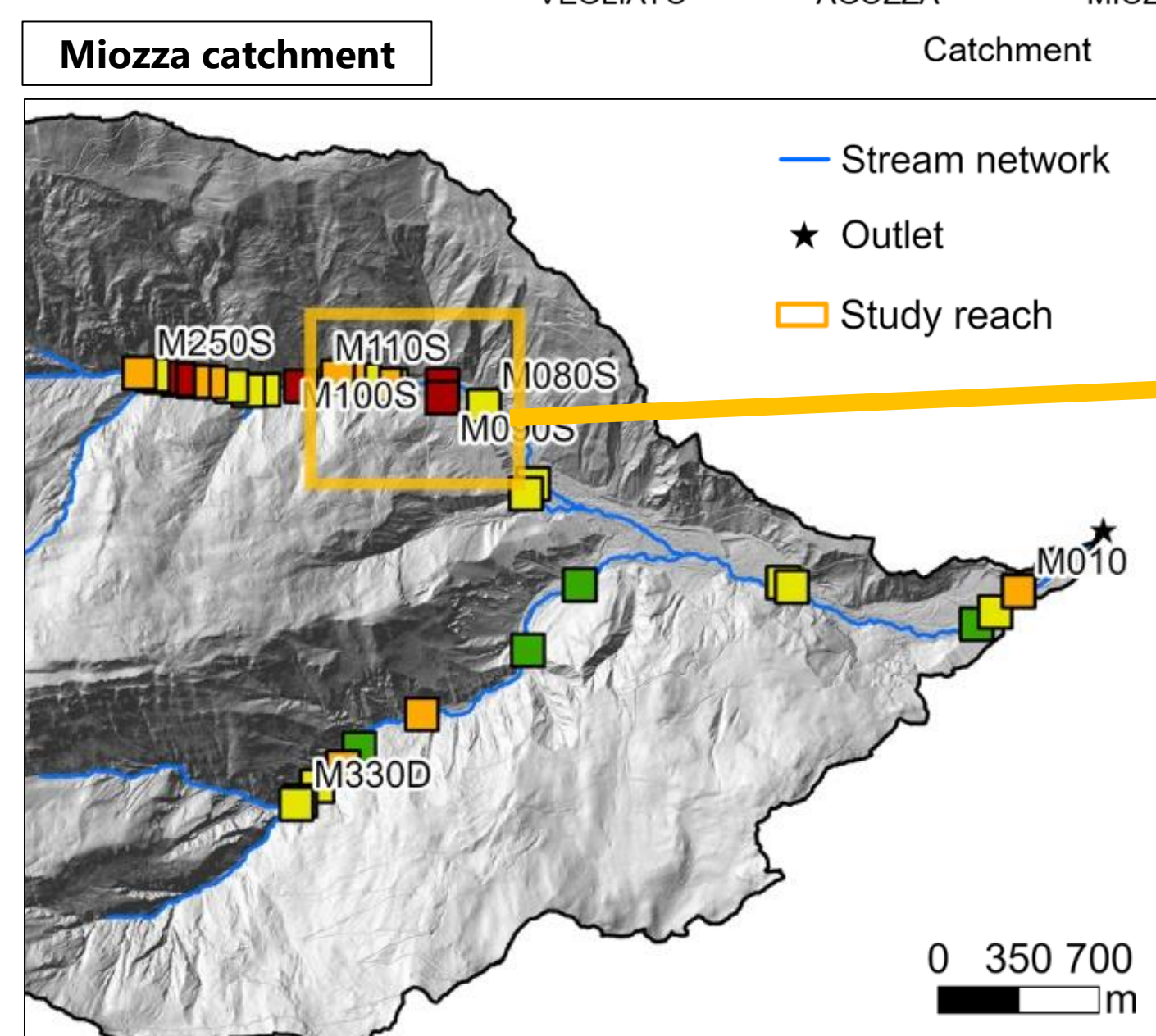
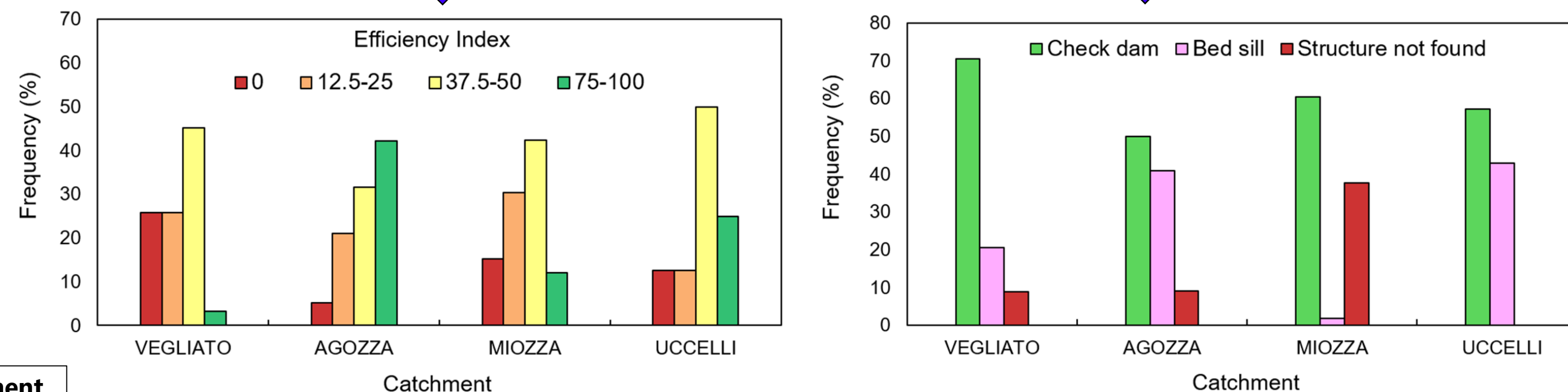
**Efficiency index for each channel control work**

| Functionality | Score | Status    |         |        |      |      |
|---------------|-------|-----------|---------|--------|------|------|
|               |       | Destroyed | Damaged |        |      | Good |
|               |       |           | High    | Medium | Low  |      |
| None          | 0     | 0         | 0       | 0      | 0    | 0    |
| Reduced       | 50    | 0         | 12.5    | 25     | 37.5 | 50   |
| Operative     | 100   | 0         | 25      | 50     | 75   | 100  |

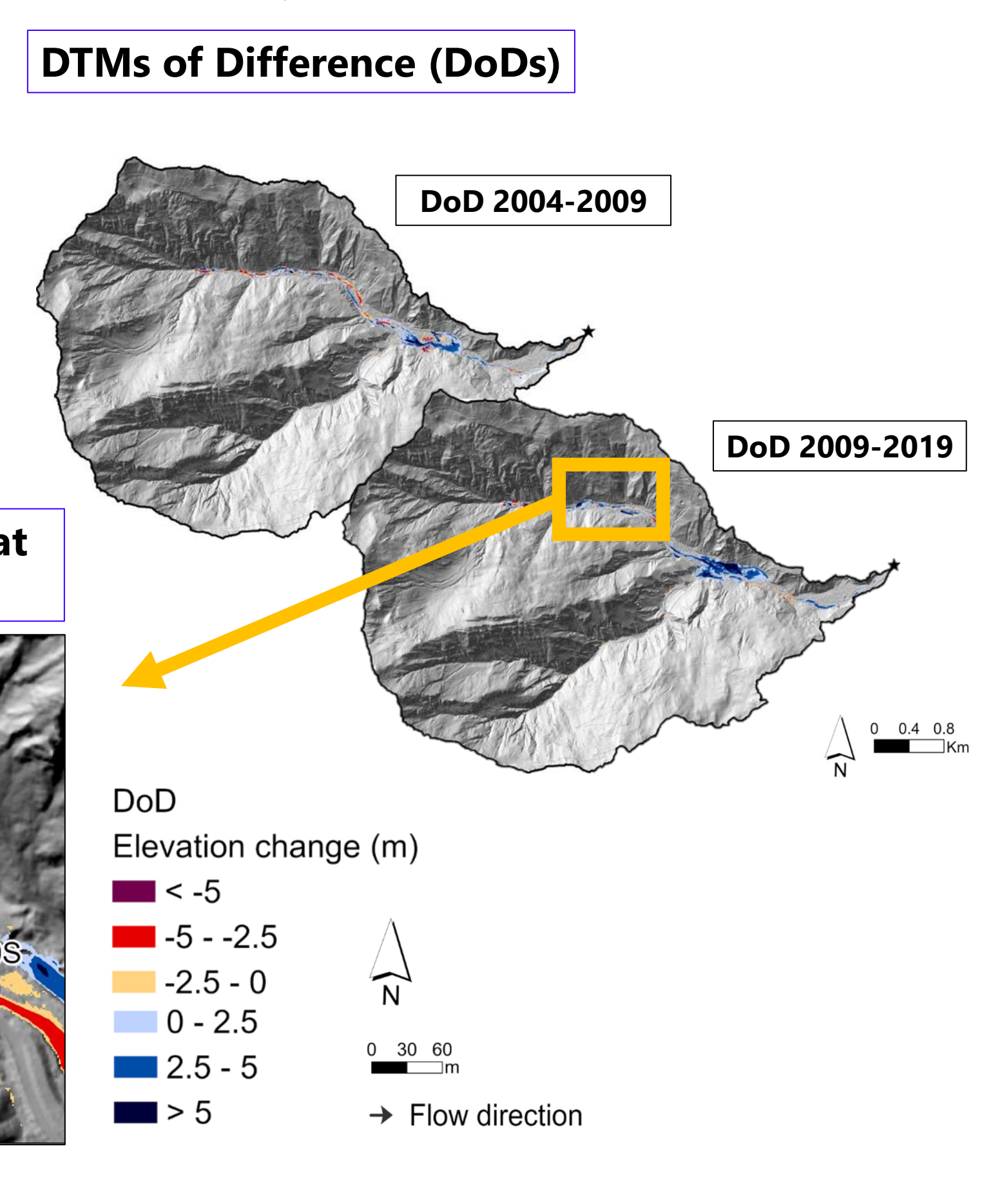
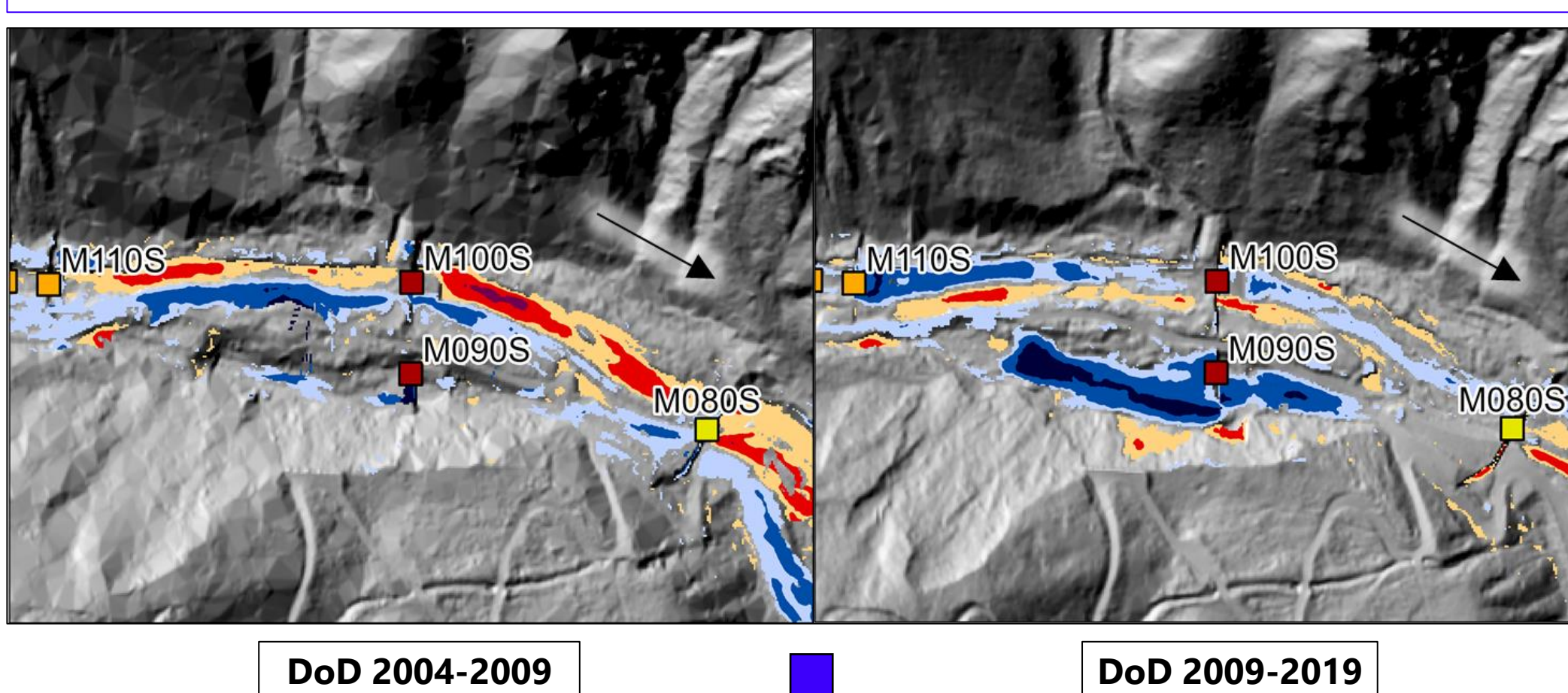
Efficiency index =  $\frac{Score_{status} \times Score_{functionality}}{100}$



Results



Multi-temporal DoDs to analyse sediment morphology dynamics at catchment and reach scale



Very simple, quick, and user-friendly efficiency index of channel control works

- More complete information, than in the past, by exploiting field surveys and remote sensing data
- A starting point for further analysis or provide numerical data for prediction models of the life-cycle of channel control works in risk management processes
- A support for the development of watershed management strategies, assess afterward the effectiveness of existing structures, and foster a more complete decision-making chain