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Identification and 3D modeling of active faults in the Dubrovnik (Croatia) offshore area – preliminary results

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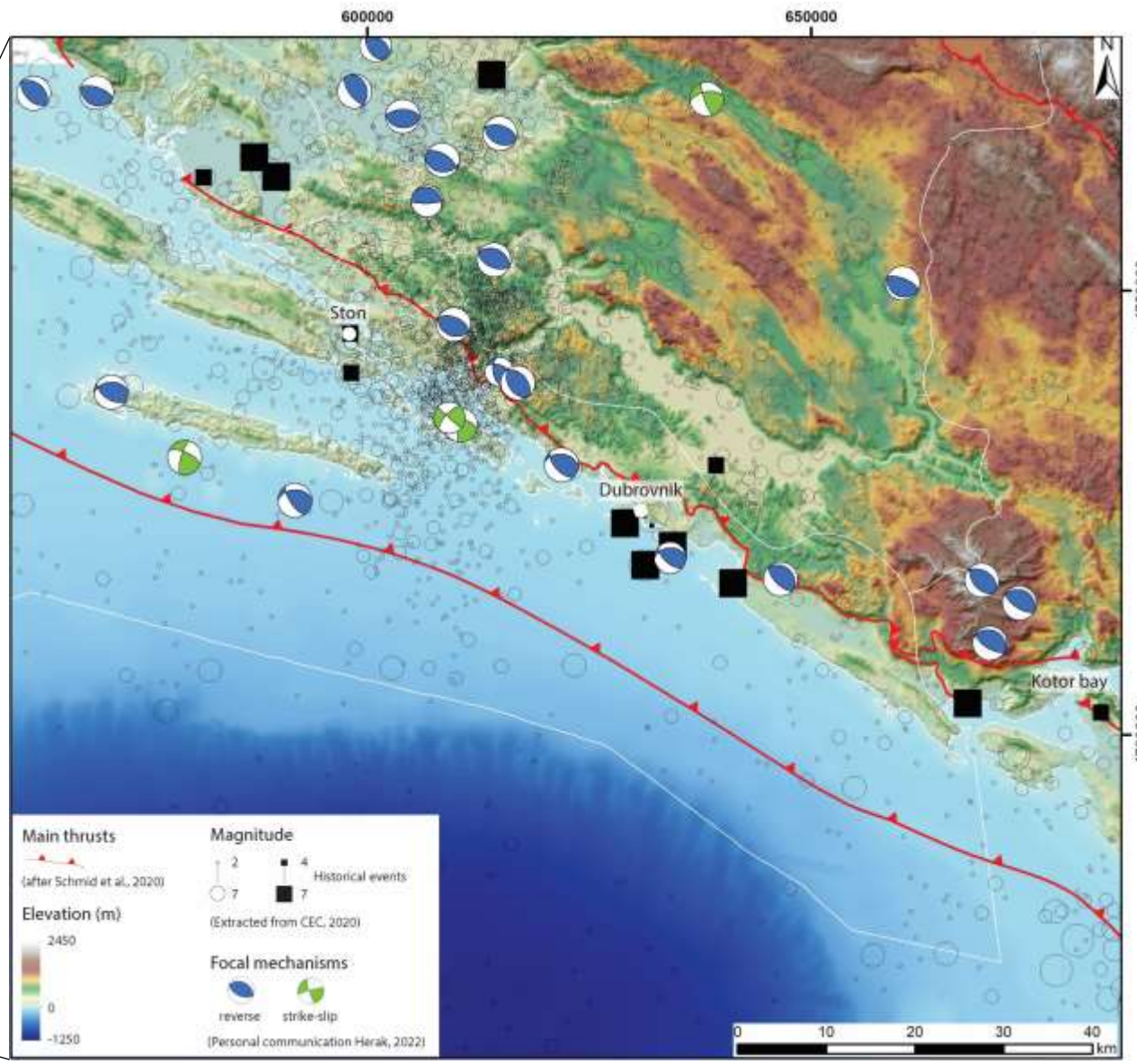
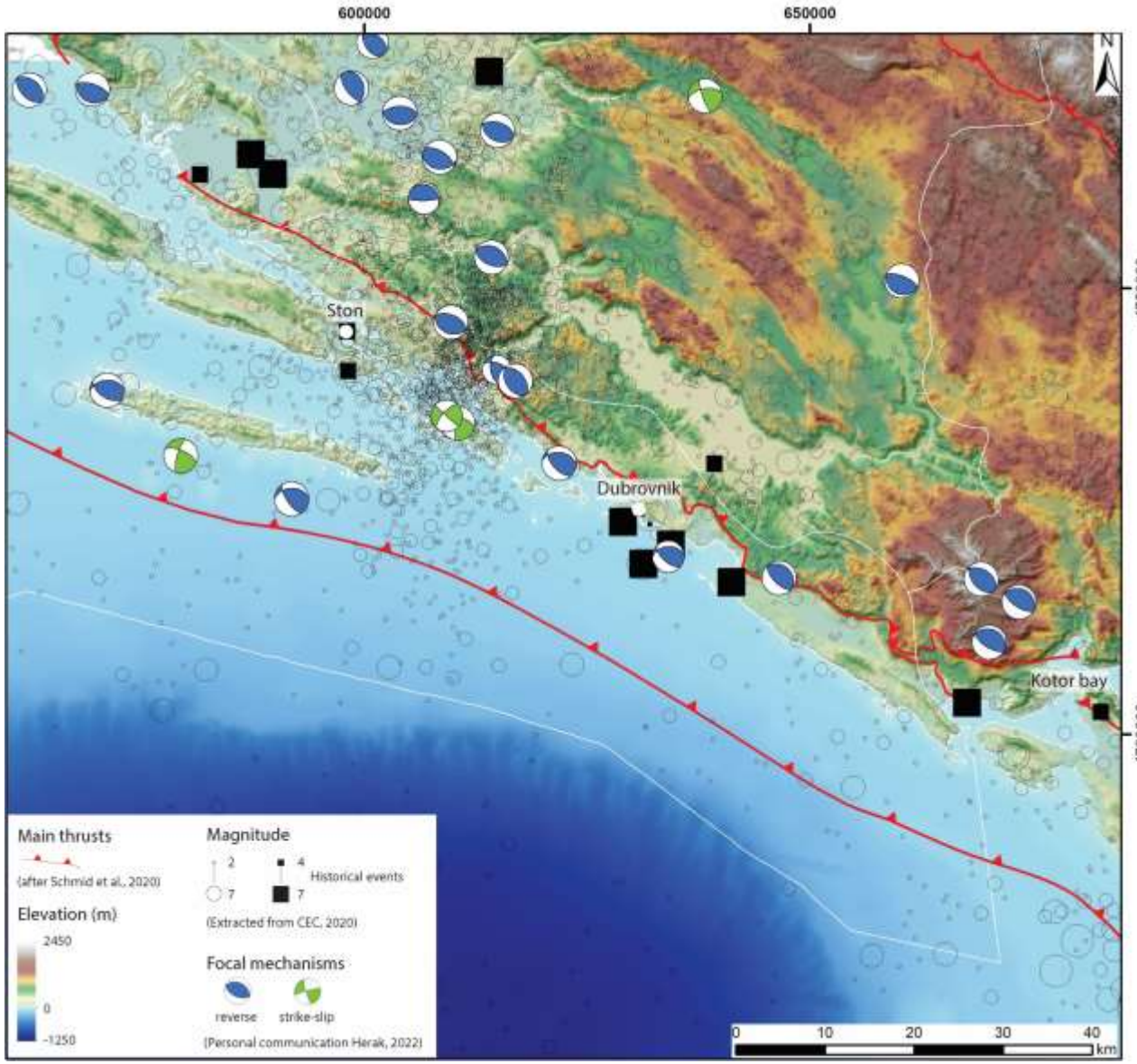
Introduction

- coastal and offshore area of southern Croatia is characterized by the relatively high seismicity



Introduction

- coastal and offshore area of southern Croatia is characterized by the relatively high seismicity
- dozen of strong earthquakes in the last 500 years
- most significant is the Great Dubrovnik earthquake from 1667 (M = 6.8 – 7.2)



Introduction

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- dozen of strong earthquakes in the last 500 years
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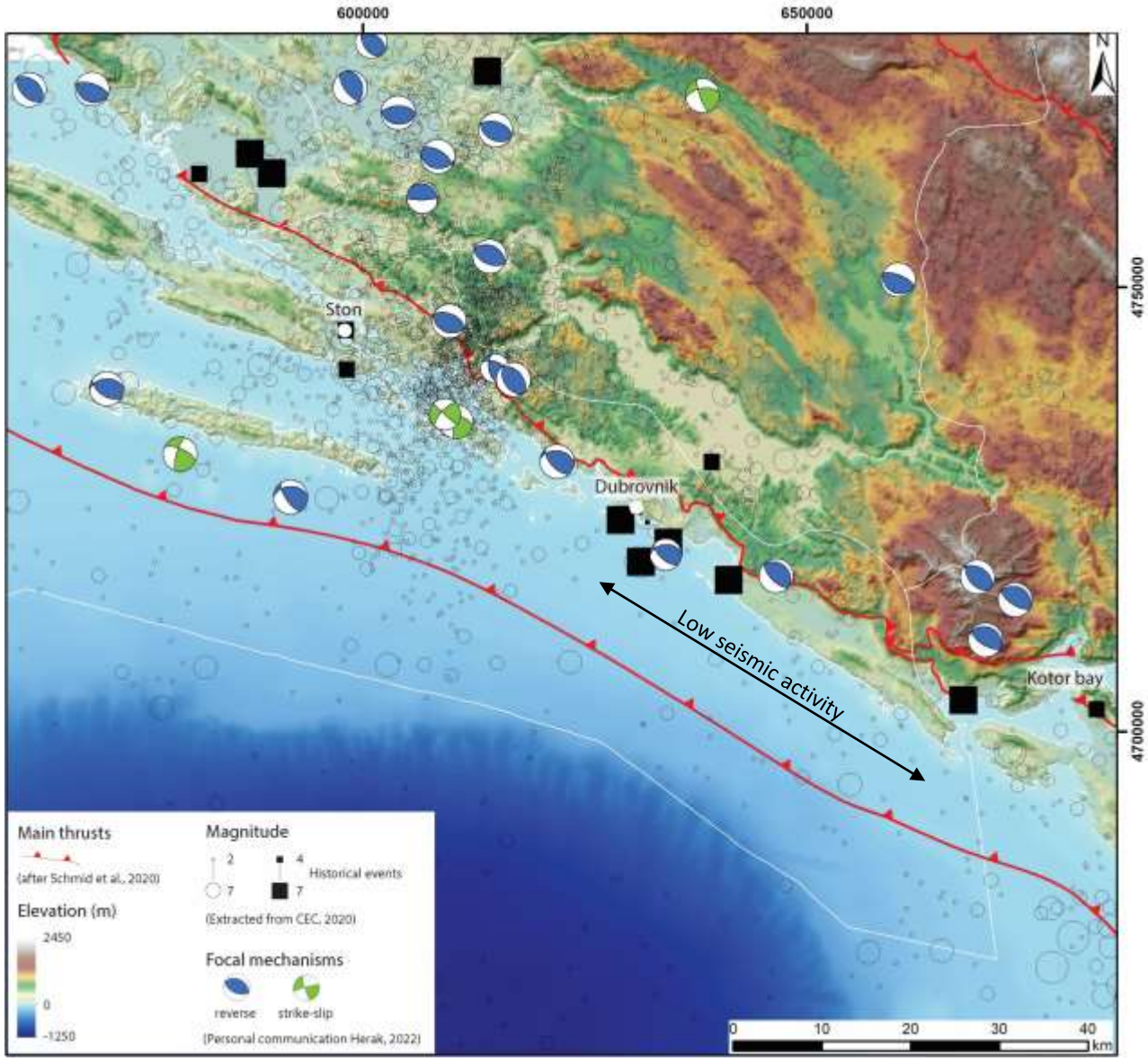
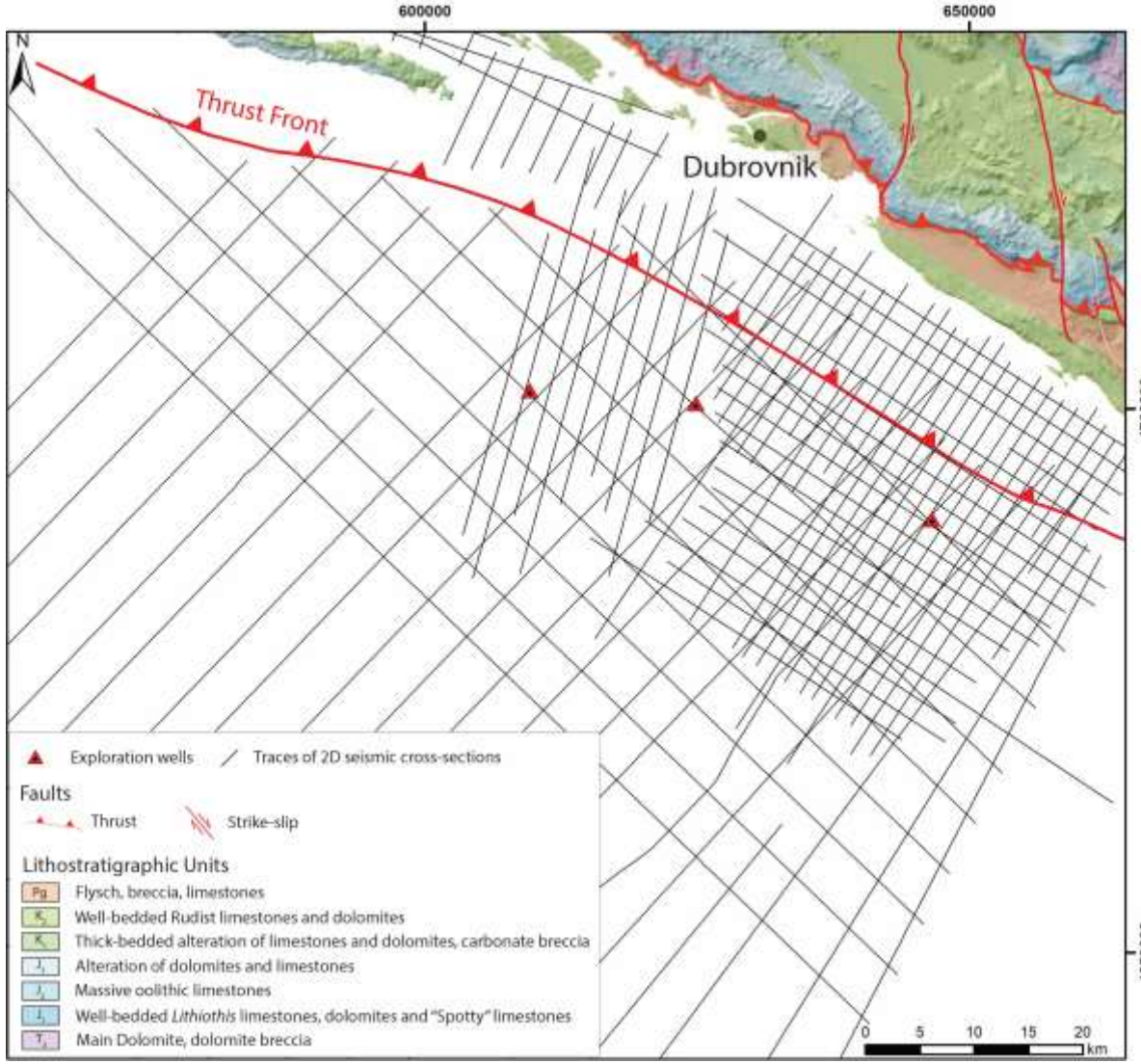
Goals:

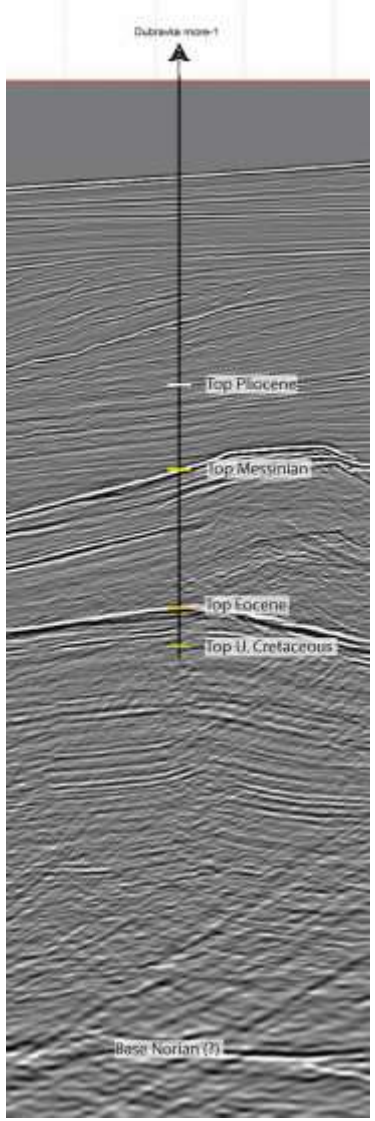
- geological and structural modelling of active earthquake generating fault systems between the city of Dubrovnik and the town of Ston



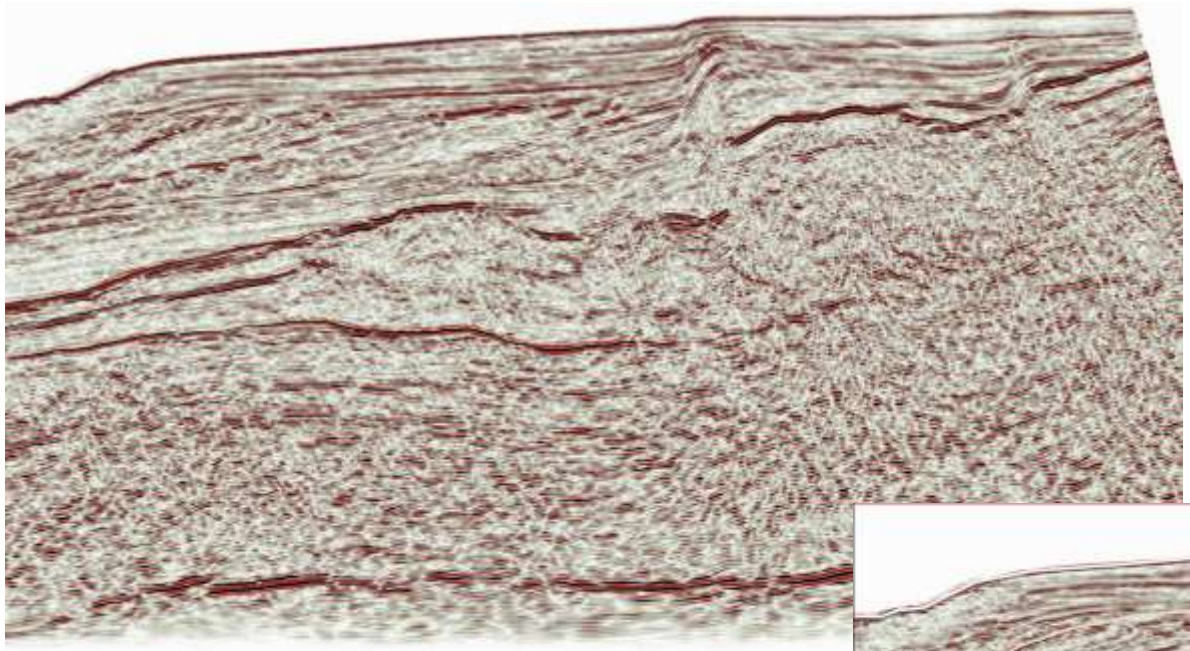
Tectonic boundaries and input data



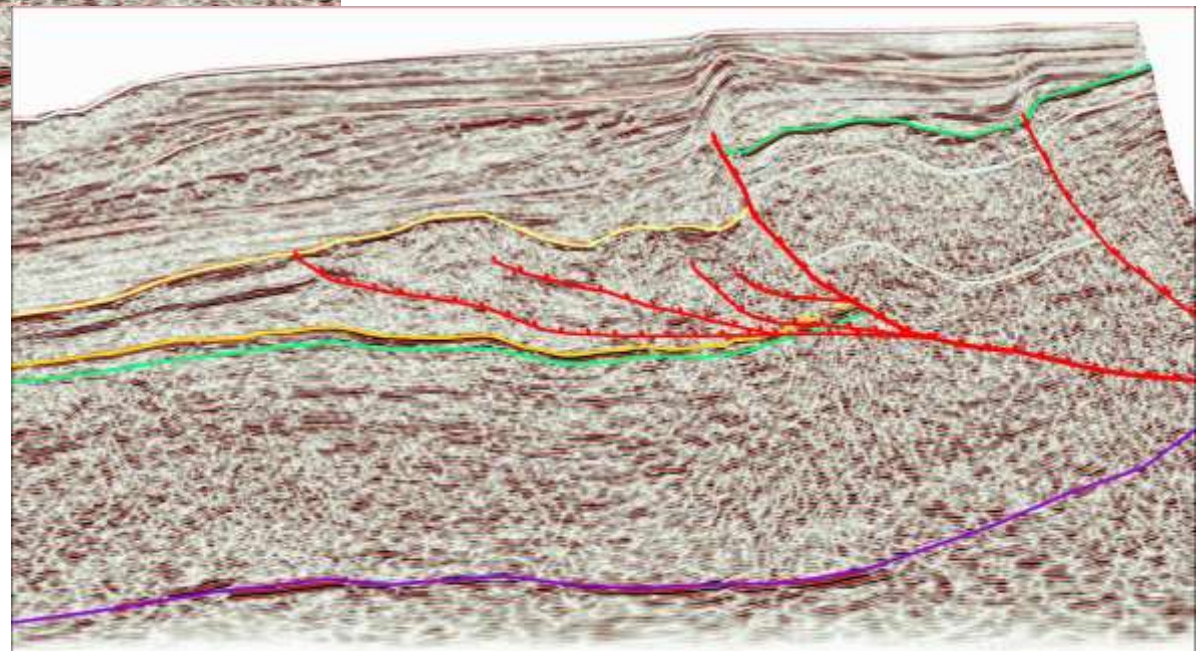
Workflow – Reflection seismic profiles interpretation



Distinctive seismic reflectors



2D seismic line interpretation

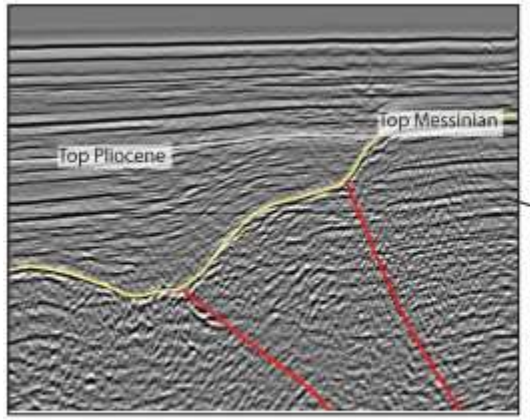


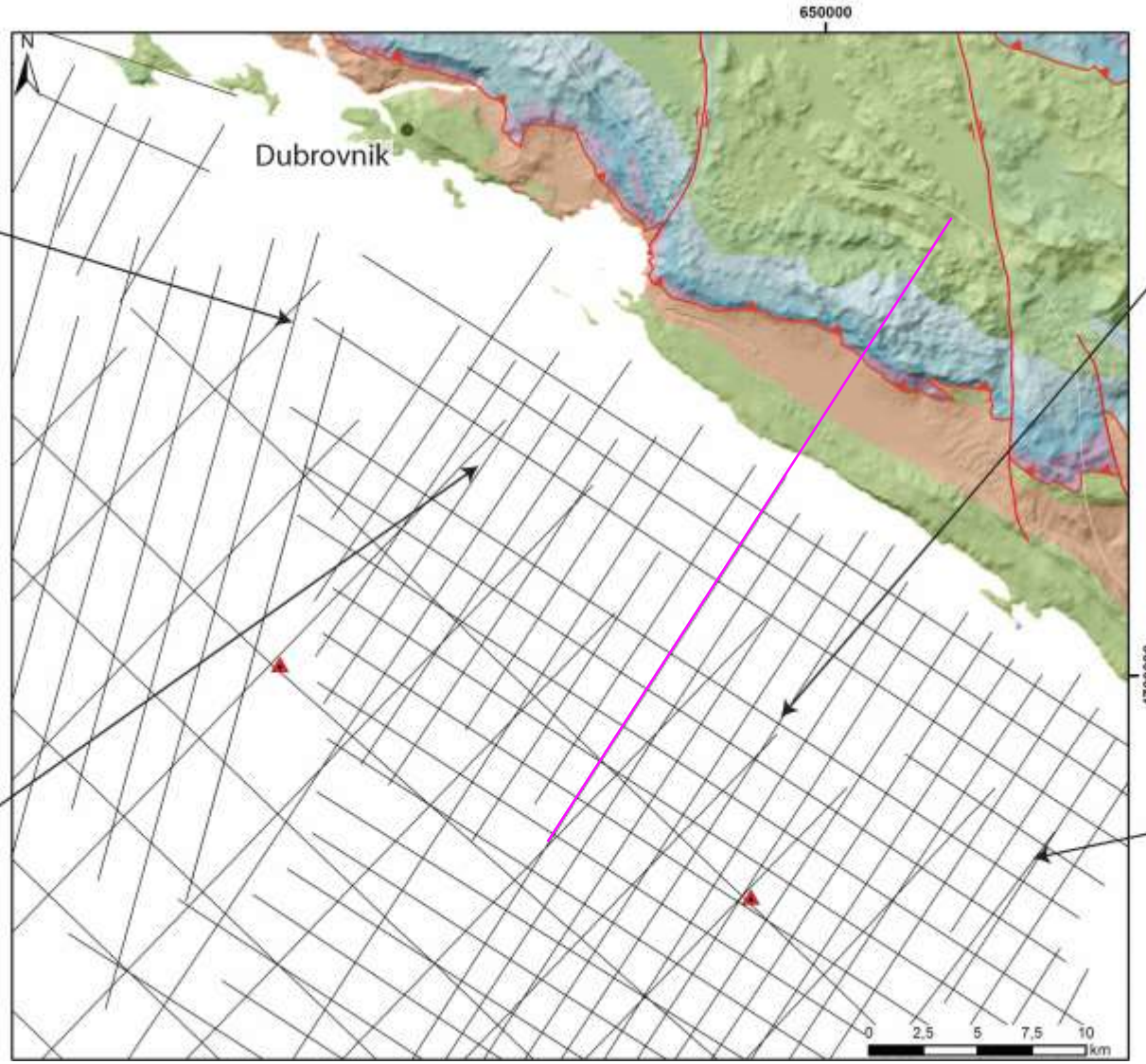
Workflow – Identification of active faults and modeling

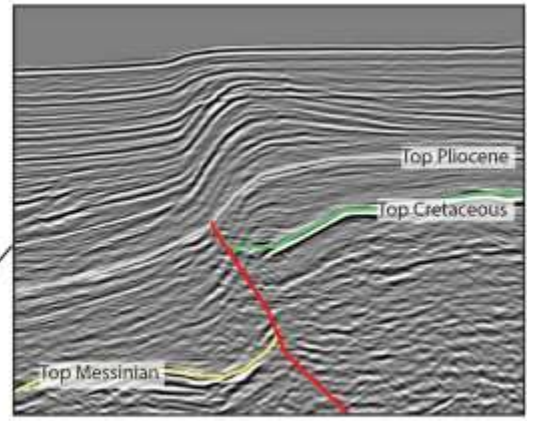
- Identification of recently active faults in this area were performed by matching at least one of the following criteria:

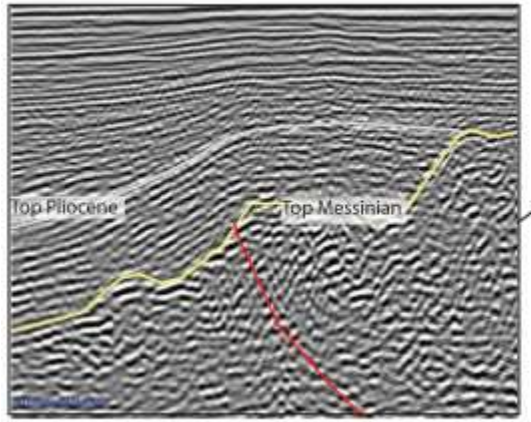
1) offsets of the Pliocene - Quaternary deposits along faults
2) deformation of Pliocene - Quaternary deposits above fault tips and
3) correlation of fault geometry and kinematics with distribution of the earthquake hypocenters and available fault plane solutions.

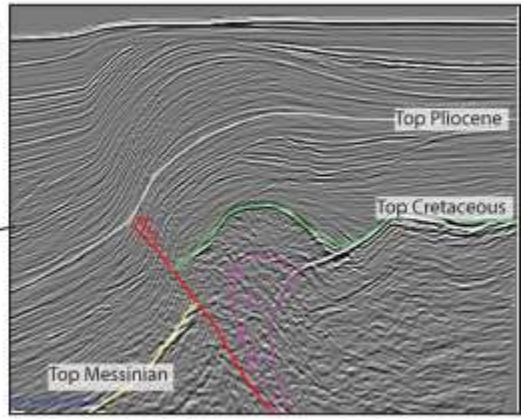
Workflow – Identification of active faults and modeling





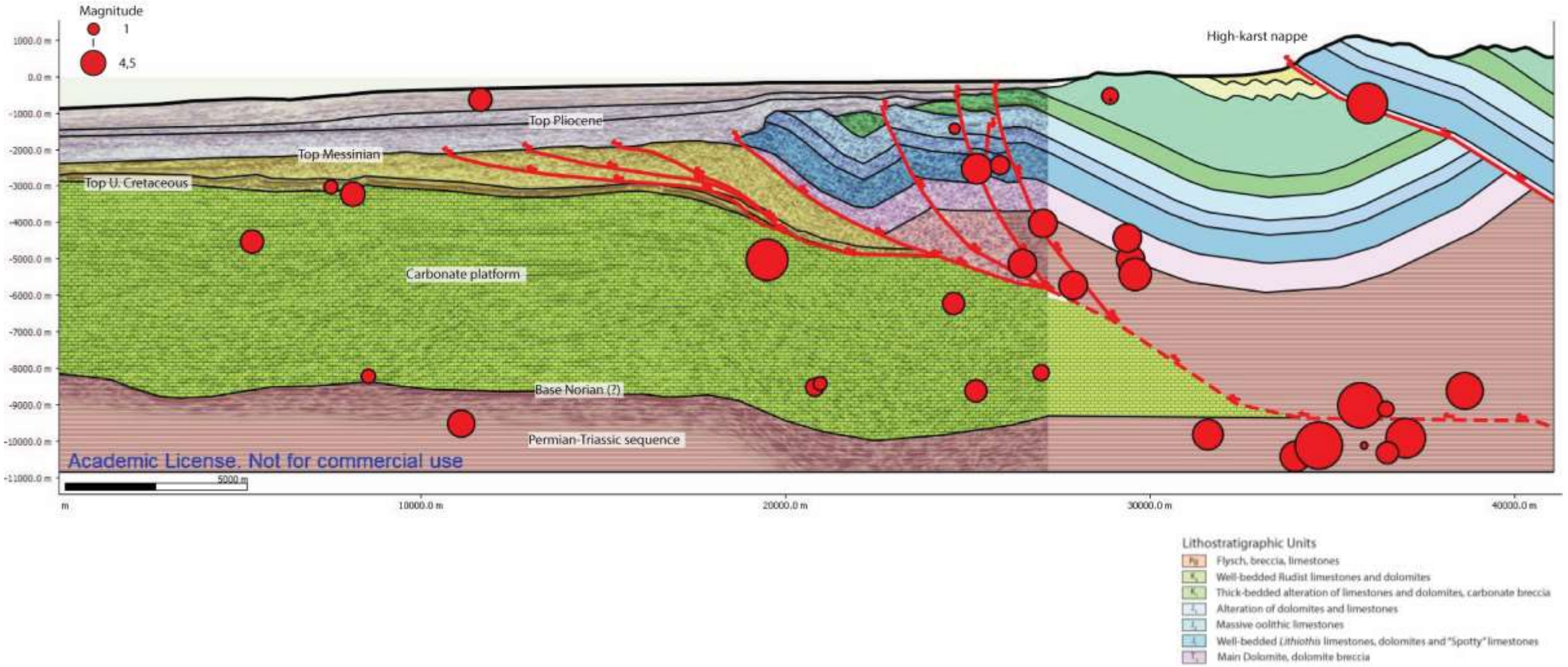




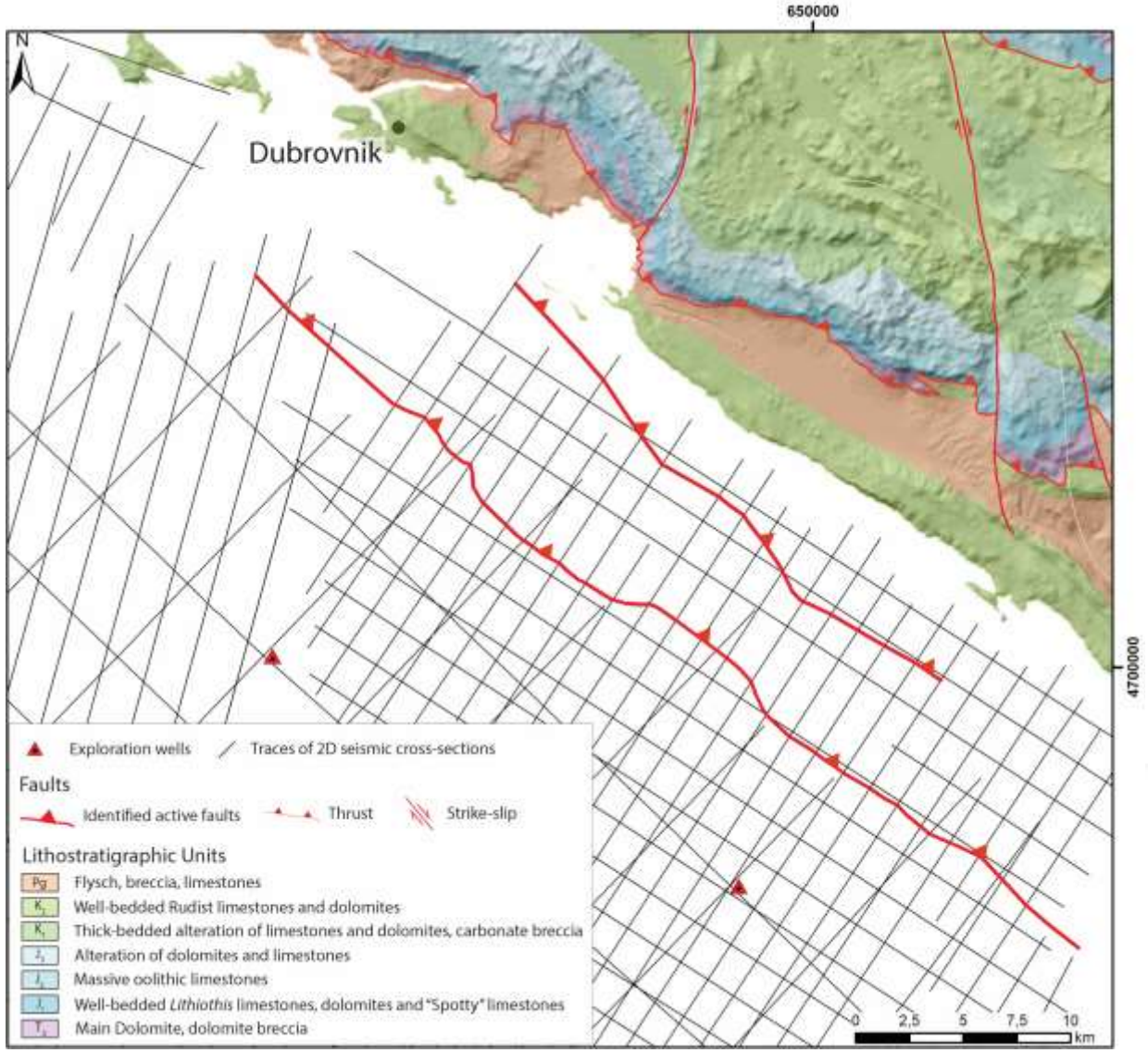


Preliminary results

Simplified unbalanced geological cross-section



Preliminary results and conclusion



- NE dipping, SW-verging active thrusts
- Preliminary results will be used for further 3D geological and structural modelling, cross-section balancing and slip-rate calculation along active faults.
- Input data for seismic shaking simulation and future seismic hazard assessment in this area.

3D model of thrust front used in preliminary seismic shaking simulation

Acknowledgements

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