



INTERACTIVE MAP OF SEISMIC HAZARD FOR NUCLEAR FACILITIES, CZECH REPUBLIC

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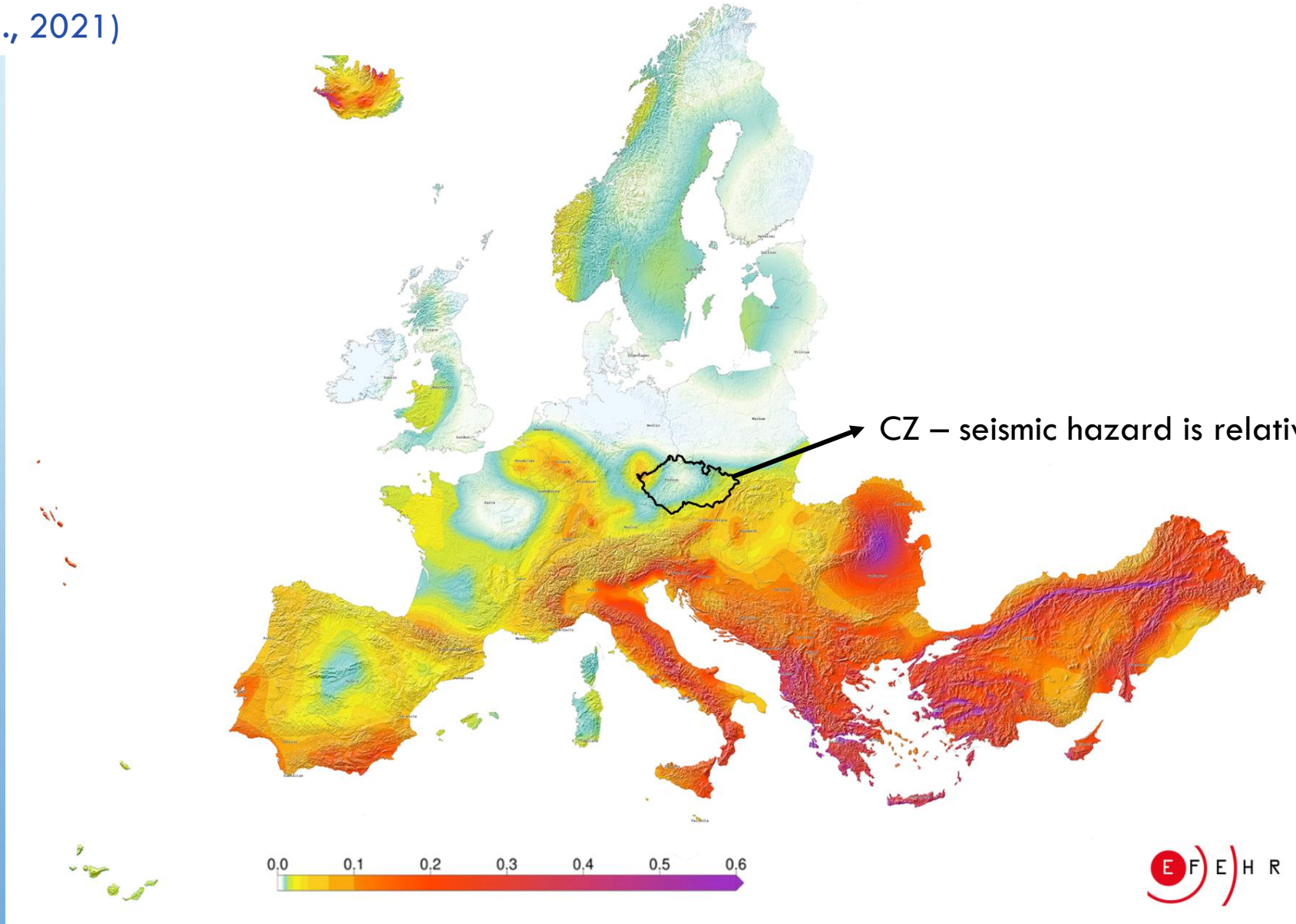


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- CZECH REPUBLIC IS SITUATED IN AN INTRAPLATE REGION WITH LOW SEISMICITY

2020 European Seismic Hazard Model (ESHM20)

(Danciu et al., 2021)



MOTIVATION

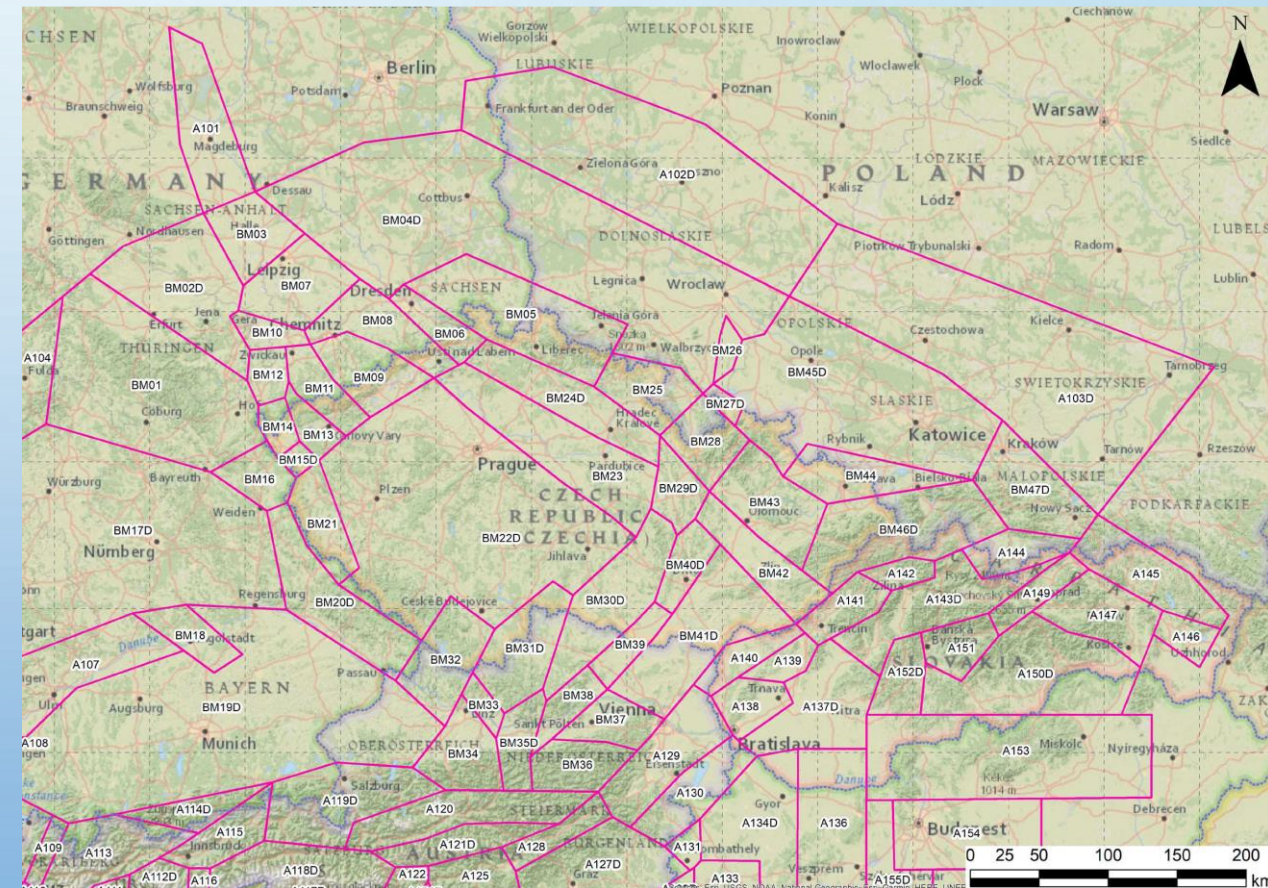
- CREATE AN INTERACTIVE MAP OF SEISMIC HAZARD OF CZECH REPUBLIC AND **THE SYSTEM OF ITS UPGRADING**
 - INCLUDE THE NEW SCIENTIFIC RESULTS IN THE FIELD OF SEISMIC HAZARD AND EXPERIENCE FROM NEW EARTHQUAKES
- FULFILL THE RECOMMENDATION OF THE IAEA FOR EVALUATION OF SEISMIC HAZARD AT THE SITES OF NUCLEAR FACILITIES

SEISMIC HAZARD

- EVALUATED BY PROBABILISTIC SEISMIC HAZARD METHOD, INCLUDING CONSTRUCTION OF LOGIC TREE AND DERIVING OF SEISMIC HAZARD CURVES
- IN AREAS, WHERE NO OR JUST A FEW WEAK EVENTS ARE RECORDED, BUT SIGNIFICANT EARTHQUAKES CAN OCCUR FROM BOTH GEOLOGICAL AND SEISMOLOGICAL POINTS OF VIEW

⇒ THE CONCEPT OF DIFFUSED SEISMICITY IS APPLIED

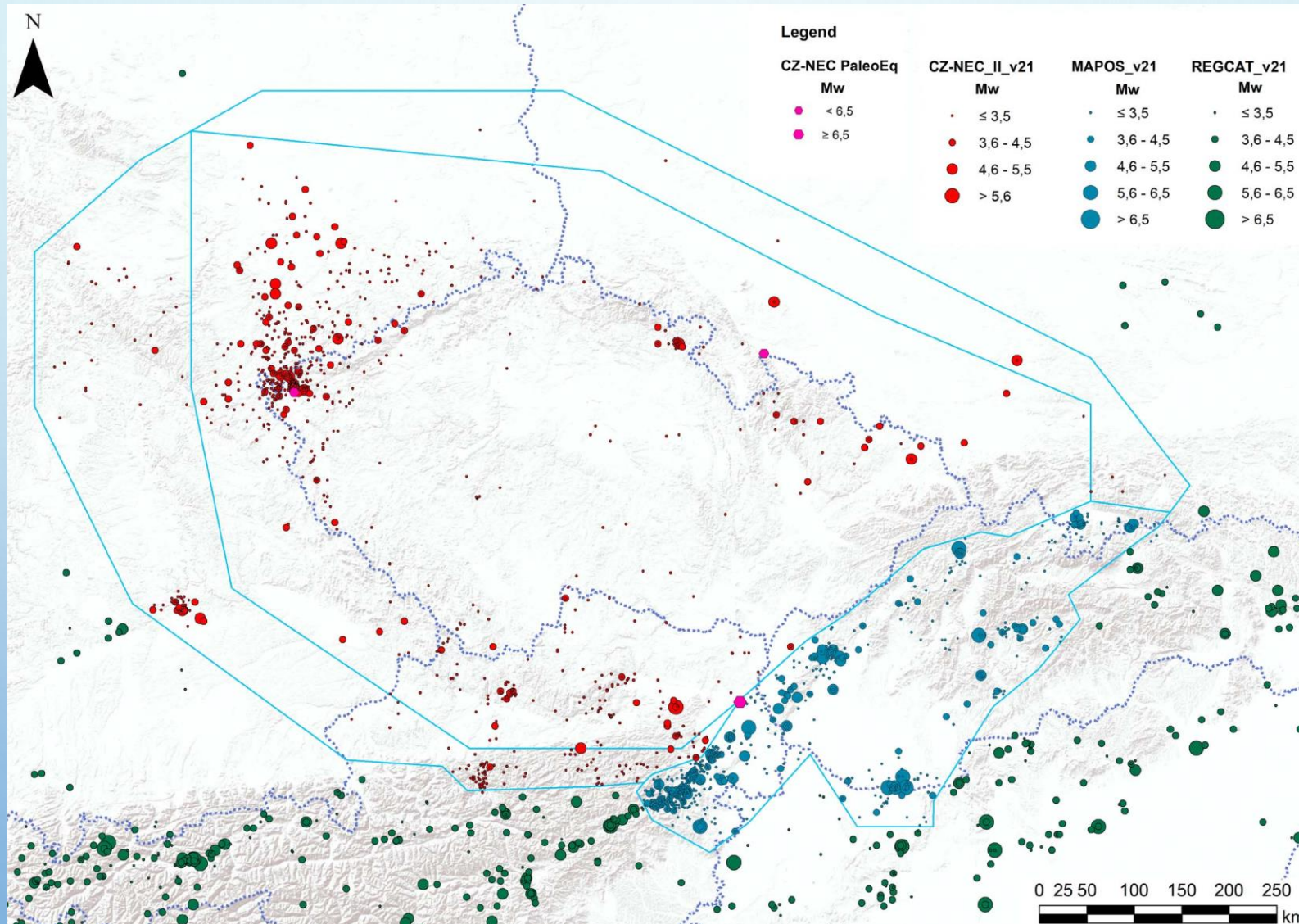
A model of the definition of areal seismic source zones based on the Small-scale areal source zones (SASZ)



EARTHQUAKE CATALOGUE

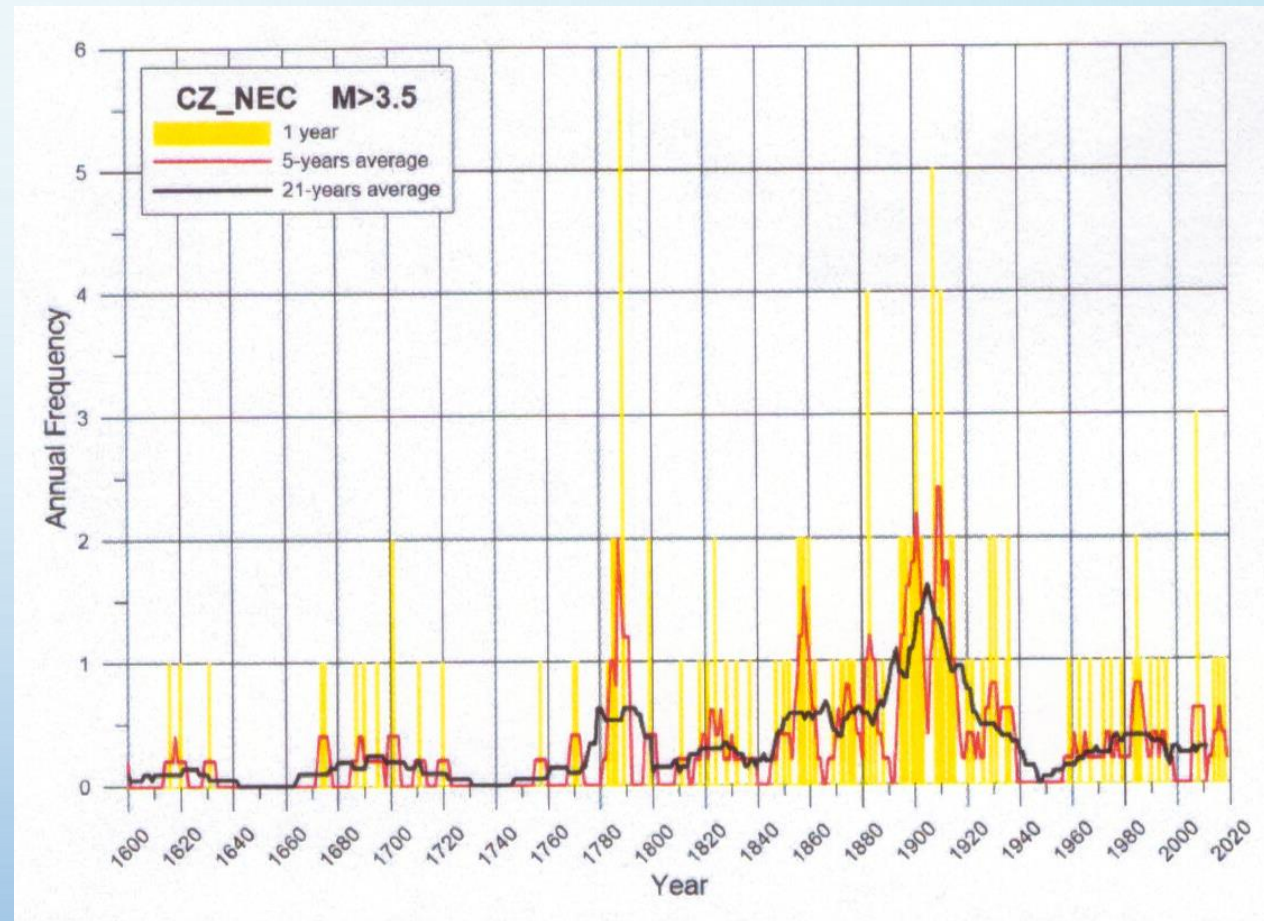
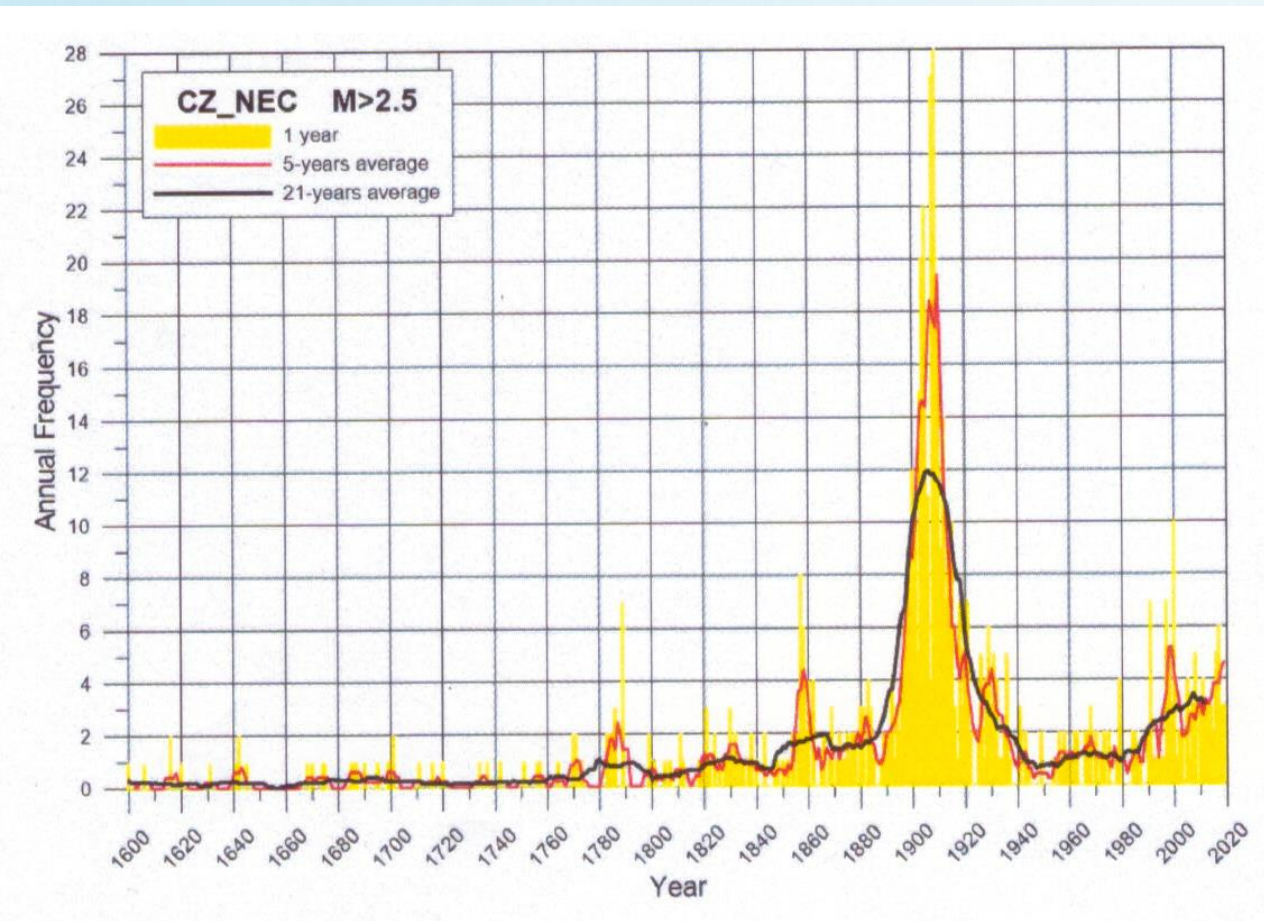
- RETRIEVE A HOMOGENEOUS CATALOGUE IS ONE OF THE MOST CRUCIAL AND DIFFICULT TASK FOR EVALUATION OF SEISMIC HAZARD FOR COUNTRIES WITH LOW OR MODERATE SEISMICITY
- HISTORICAL CATALOG COVER A MUCH SHORTER PERIOD THAN THE AVERAGE TIME BETWEEN THE STRONG (CONTROLLING) EARTHQUAKES
 - COMPLICATE EVALUATION OF FOCAL ZONE MAXIMAL MAGNITUDE
- NEW METHOD OF MAXIMAL MAGNITUDE DETERMINATION WAS DEVELOPED
 - IT USES BAYESIAN APPROACH COMBINING A PRIORI INFORMATION FROM WIDER REGION WITH HISTORICAL EARTHQUAKE CATALOGUE RESULTING IN A PROBABILITY DISTRIBUTION OF MAXIMUM MAGNITUDE
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EARTHQUAKE CATALOGUE



REVISED EARTHQUAKE CATALOGUES COVERING THE BOHEMIAN MASSIF AND THE ADJACENT ALPINE-CARPATHIAN REGION

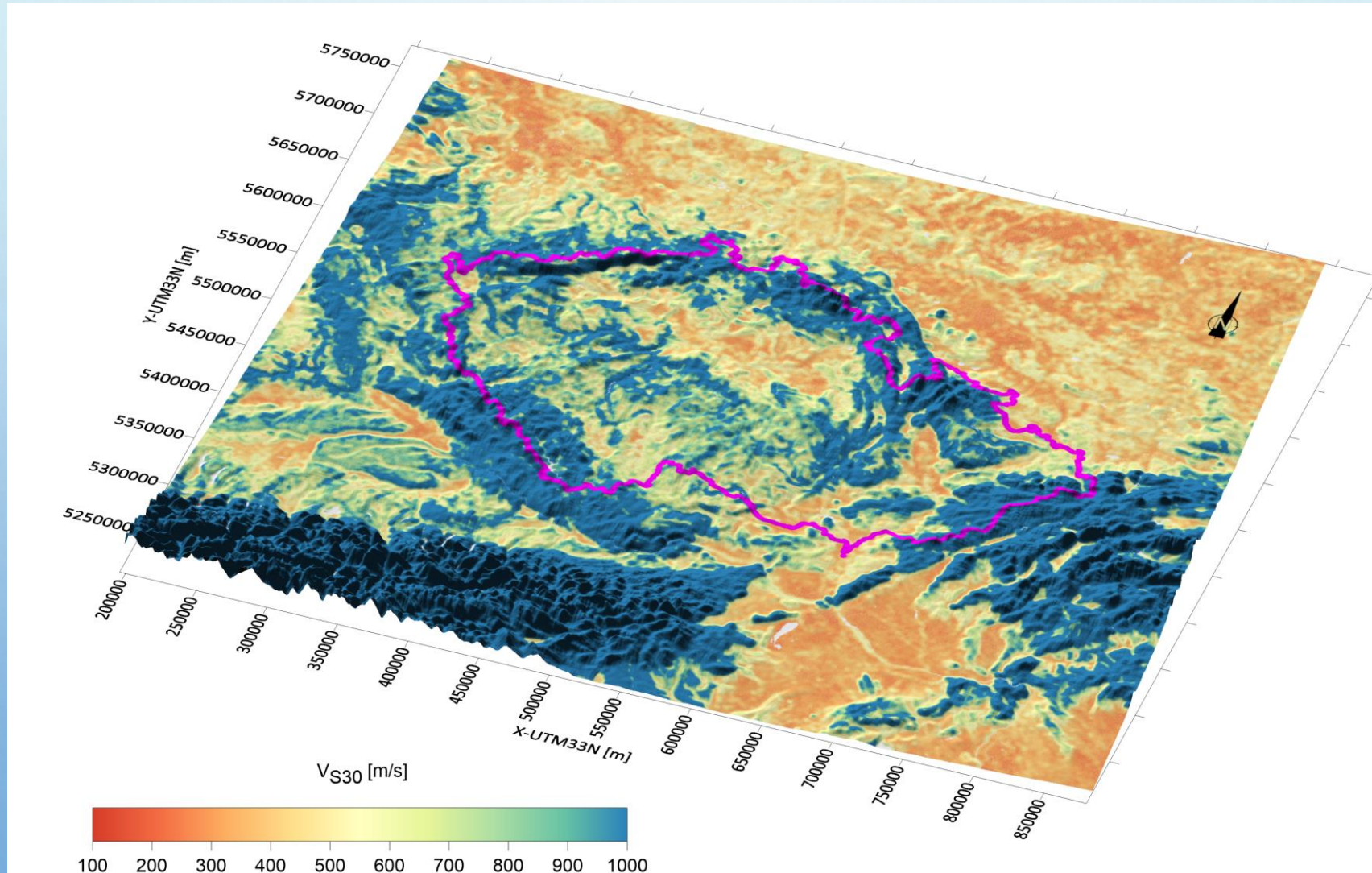
ANNUAL FREQUENCY OF EARTHQUAKES FOR CATALOGUE CZ-NEC-II_V2021



- IN THE FIRST DECADE OF TWENTIETH CENTURY THE SEISMICITY WAS STRONGER THAN IN SUCCEEDING DECADES
- THE TIME COMPLETENESS OF THE CATALOGUE DEPENDS ON THE MAGNITUDE
 - IT CAN BE DETERMINED FROM THE FREQUENCY OF EARTHQUAKES IN THE CATALOGUE FOR DIFFERENT MAGNITUDES ASSUMING THAT IN COMPLETE CATALOGUE IT IS CONSTANT – HERE COMPLICATED SITUATION

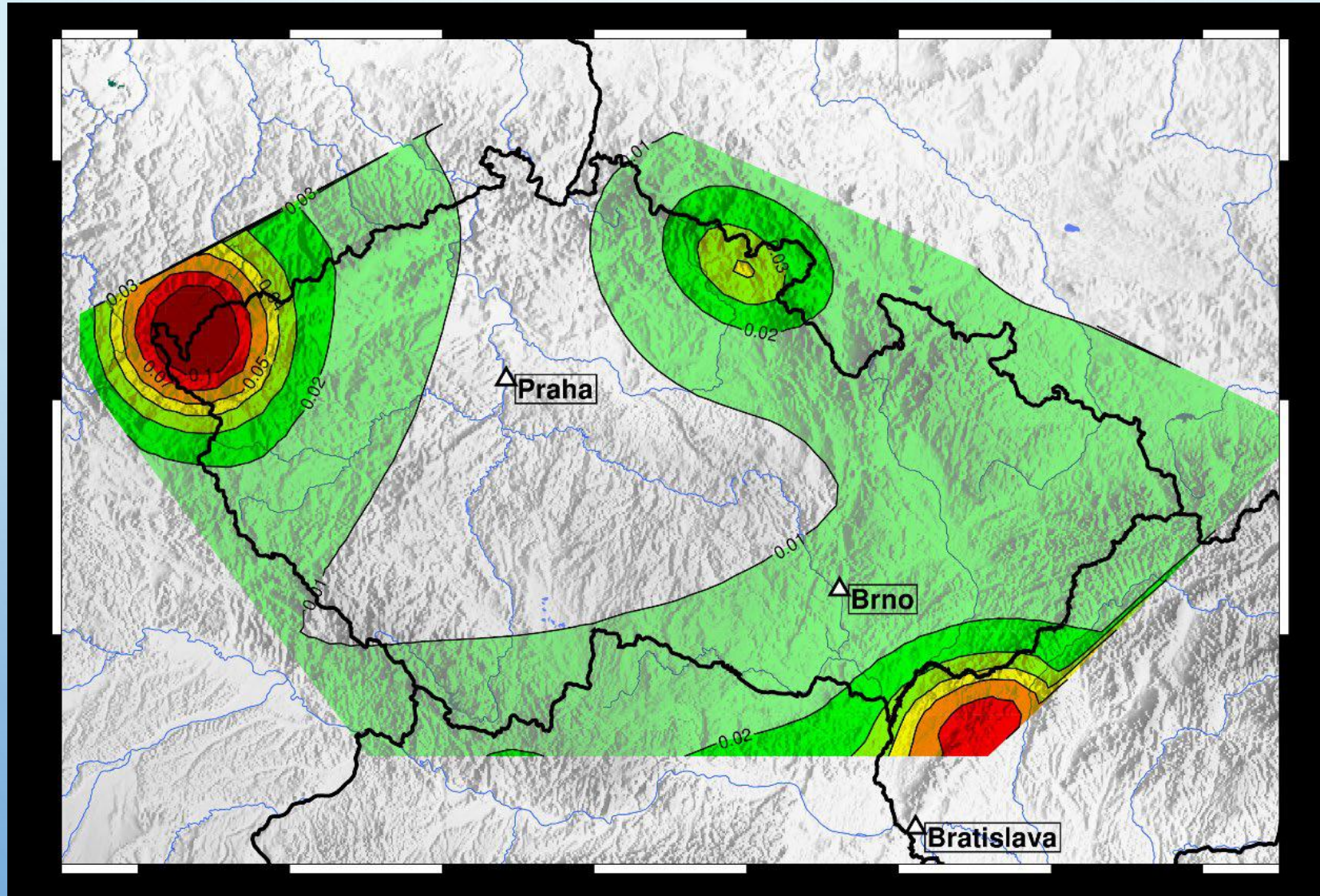
NEW Vs30 MAP

- MAP COMBINES METHOD OF WALD AND ALLEN (2007), USING TOPOGRAPHIC SLOPE AS A PROXY FOR SEISMIC SITE CONDITIONS AND AMPLIFICATION, AND NEW VS30 FIELD MEASUREMENTS



THE RESULT OF PSHA FOR THE CZECH REPUBLIC

- OBTAINED THROUGH THE OPENQUAKE ENGINE (PAGANI ET AL., 2014),





THANK YOU FOR YOUR ATTENTION

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