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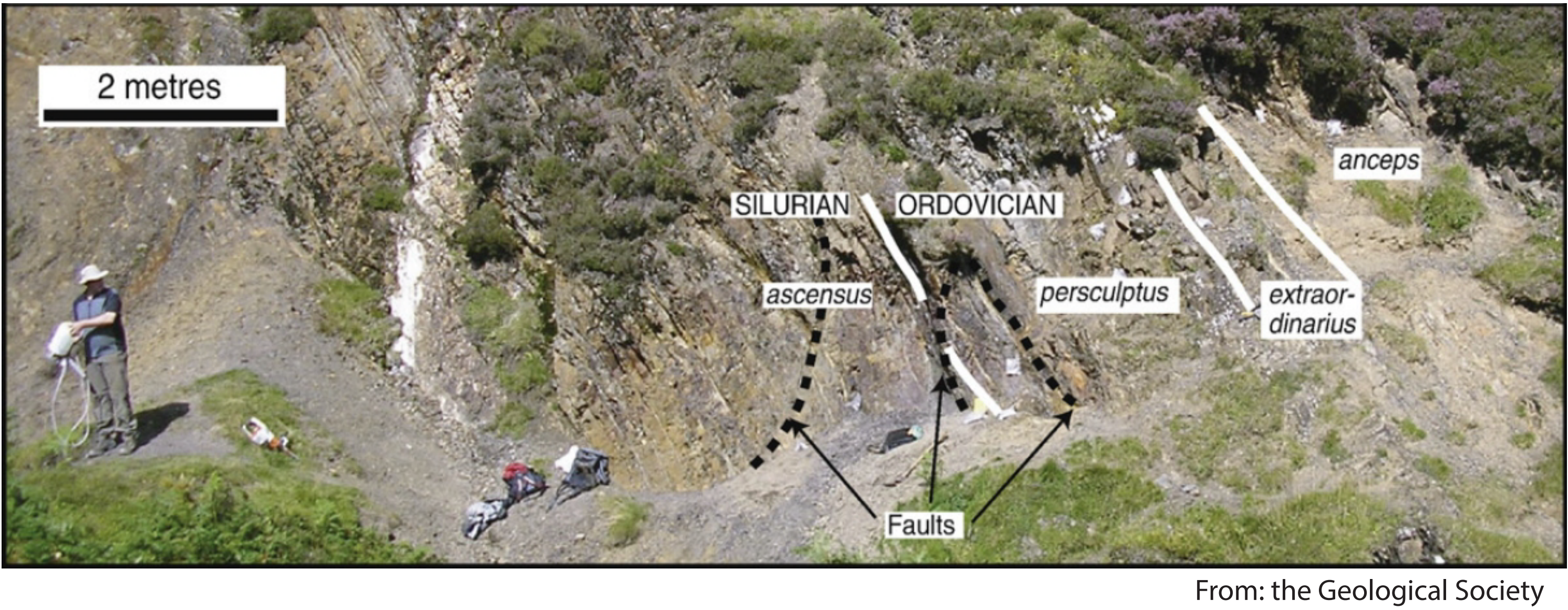
1. Introduction

Dob's Linn (Scotland) is the current Global Boundary Stratotype Section and Point (GSSP) for the Ordovician-Silurian Boundary calibrated to 443.8±1.5 Ma (Cohen et al., 2019), partly based on biostratigraphic markers, radiometric dates, and stastical modeling.

Dob's Linn has significantly influenced our understanding of how life evolved over the Ordovician to early Silurian, including understanding and time constraining the Late Ordovician Mass Extinction (LOME).

We dated hundreds of zircon grains extracted from defined metabentonites from four ash horizons exposed at Dob's Linn using LA-ICP-MS and several grains using CA-ID-TIMS.

2. Problems and Objectives

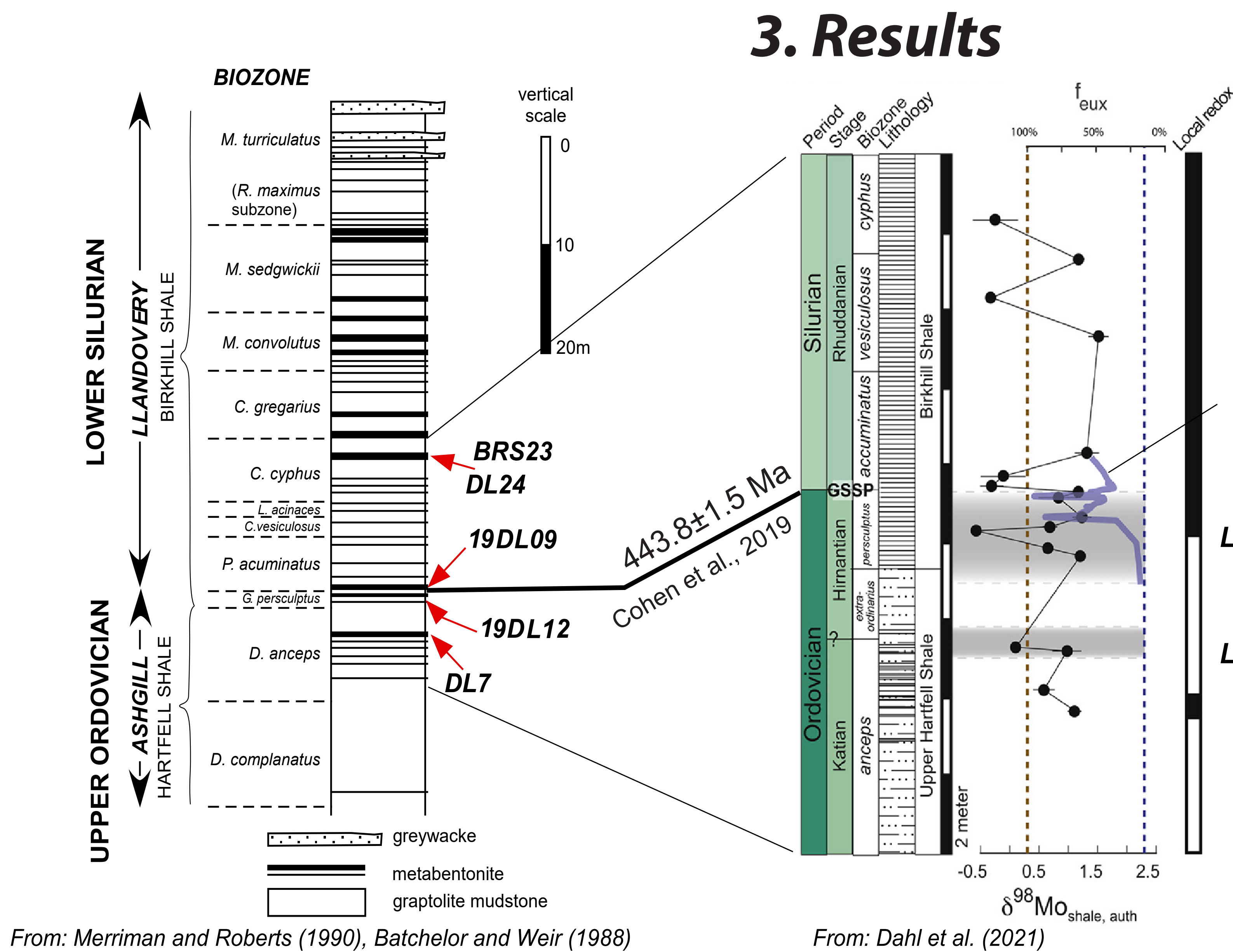
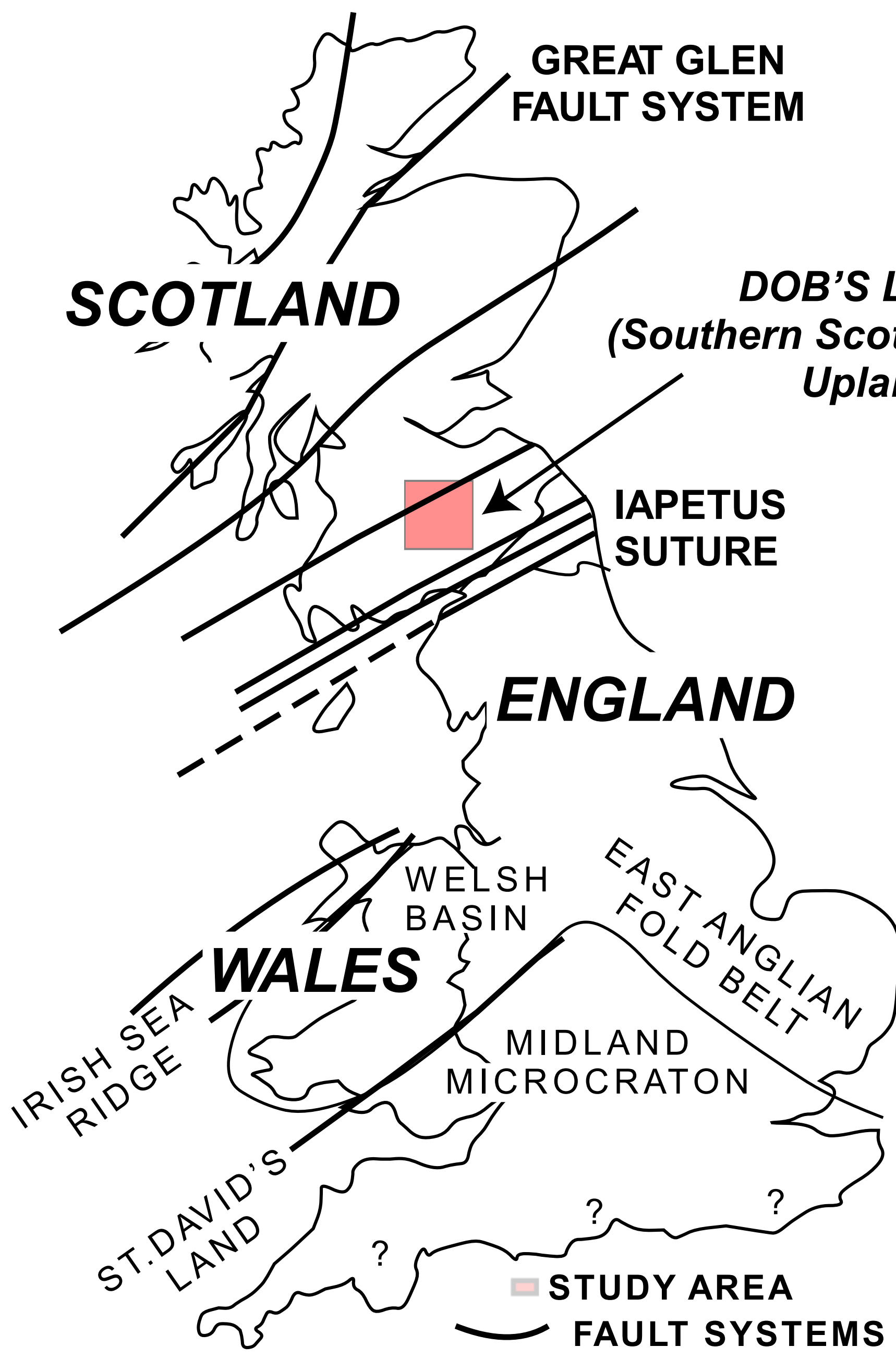


- Difficult to correlate the standard marine based geological time scale using biostratigraphy and imprecise geochronology.

- LA-ICP-MS produced ²³⁸U-²⁰⁶Pb zircon dates significantly younger than expected re-assigning Dob's Linn chronostratigraphic section to Silurian-Devonian.

- CA-ID-TIMS produced ²³⁸U-²⁰⁶Pb zircon dates marginally older than the current Ordovician-Silurian boundary (443.8±1.5 Ma) re-assigning Dob's Linn chronostratigraphic section to Ordovician (Katian age) or regionally to (Ashgill age).

- Our objective is to constrain a maximum depositional (MDA) age using accurate ²³⁸U-²⁰⁶Pb zircon ages for the Ordovician-Silurian



3. Results

BRS23: <u>LA-ICP-MS 206Pb/238U</u> YSG: 392±10 Ma YSP: 441±0.5 Ma (N=128/137) WM: 439±0.5 Ma (N=137/137) TuffZirc age: 441+2 -3 Ma (N=134/137) <u>CA-ID-TIMS 206Pb/238U</u> WM: 442±0.5 Ma (N=4/4)	DL24: <u>LA-ICP-MS 206Pb/238U</u> YSG: 358±8 Ma YSP: 425±0.4 Ma (N=56/96) WM: 417±0.3 Ma (N=96/96) TuffZirc age: 420+3 -3 Ma (N=64/96) <u>CA-ID-TIMS 206Pb/238U</u> 440±1 Ma (N=1/1)
19DL09: <u>LA-ICP-MS 206Pb/238U</u> YSG: 327±5 Ma YSP: 329±2 Ma (N=3/17) WM: 425±0.9 Ma (N=17/17) TuffZirc age: 447+7 -8Ma (N=13/17) <u>CA-ID-TIMS 206Pb/238U</u> WM 449±0.8 Ma (N=2/3)	19DL12: <u>LA-ICP-MS 206Pb/238U</u> YSG: 377±8 Ma YSP: 424±2 Ma (N=3/11) WM: 432±1 Ma (N=11/11) TuffZirc age: 442+8 -10 Ma (N=9/11) <u>CA-ID-TIMS 206Pb/238U</u> 446±2 Ma (N=1/1)
DL7: <u>LA-ICP-MS 206Pb/238U</u> YSG: 402±12 Ma YSP: 411±3 Ma (N=2/26) WM: 434±1 Ma (N=26/26) TuffZirc age: 435+4 -2 Ma (N=25/26)	

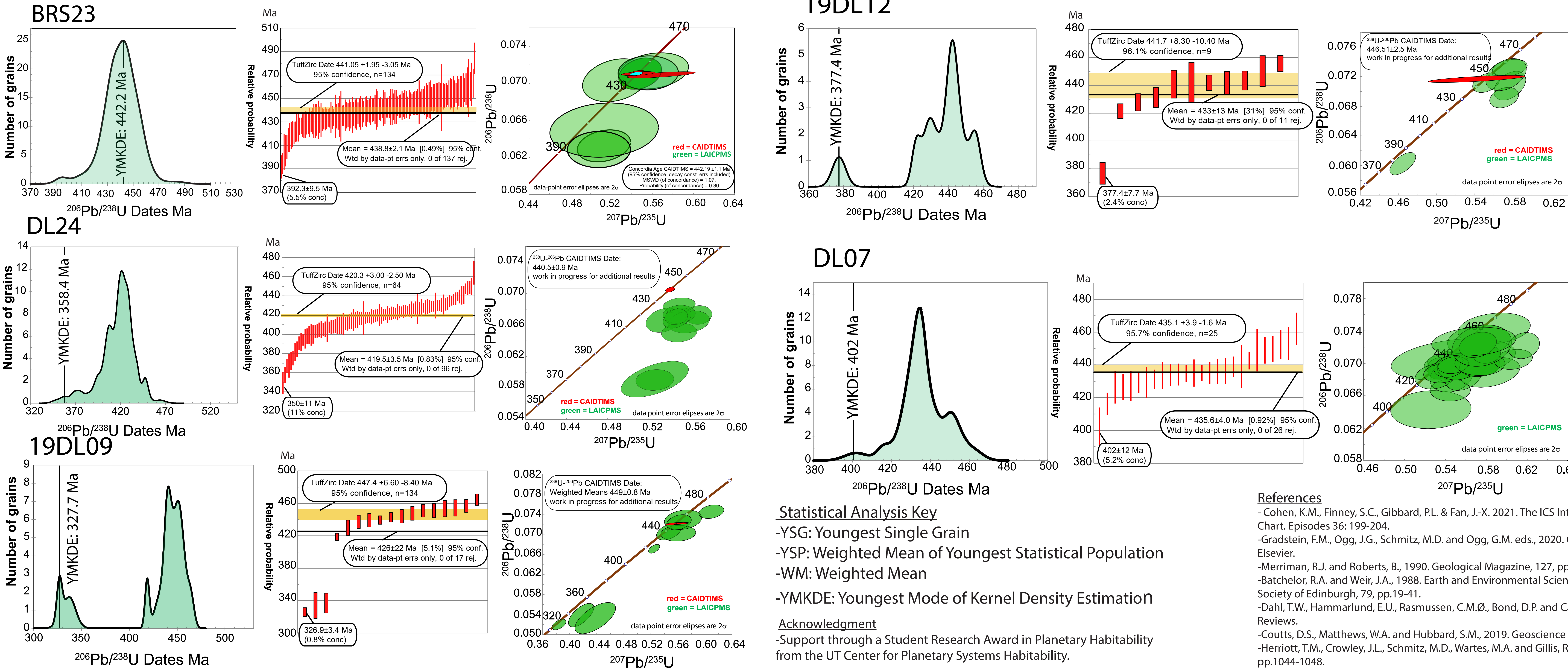
4. Conclusions

-LA-ICP-MS U-Pb dates overall produce younger dates compared to CA-ID-TIMS.

-Young LA-ICP-MS dates results could be attributed to Pb loss due to hydrothermal alteration during the Acadian and Alleghenian orogenies.

-YSG, YSP, WM, and TuffZirc dates are different compared to ²⁰⁶Pb/²³⁸U CA-ID-TIMS.

-Sample closest to Ordovician-Silurian boundary located in the *Parakidograptus acuminatus* biozone yields 2/3 zircon grains with a CA-ID-TIMS Maximum Depositional Age (MDA): 449±0.8 Ma.



References

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