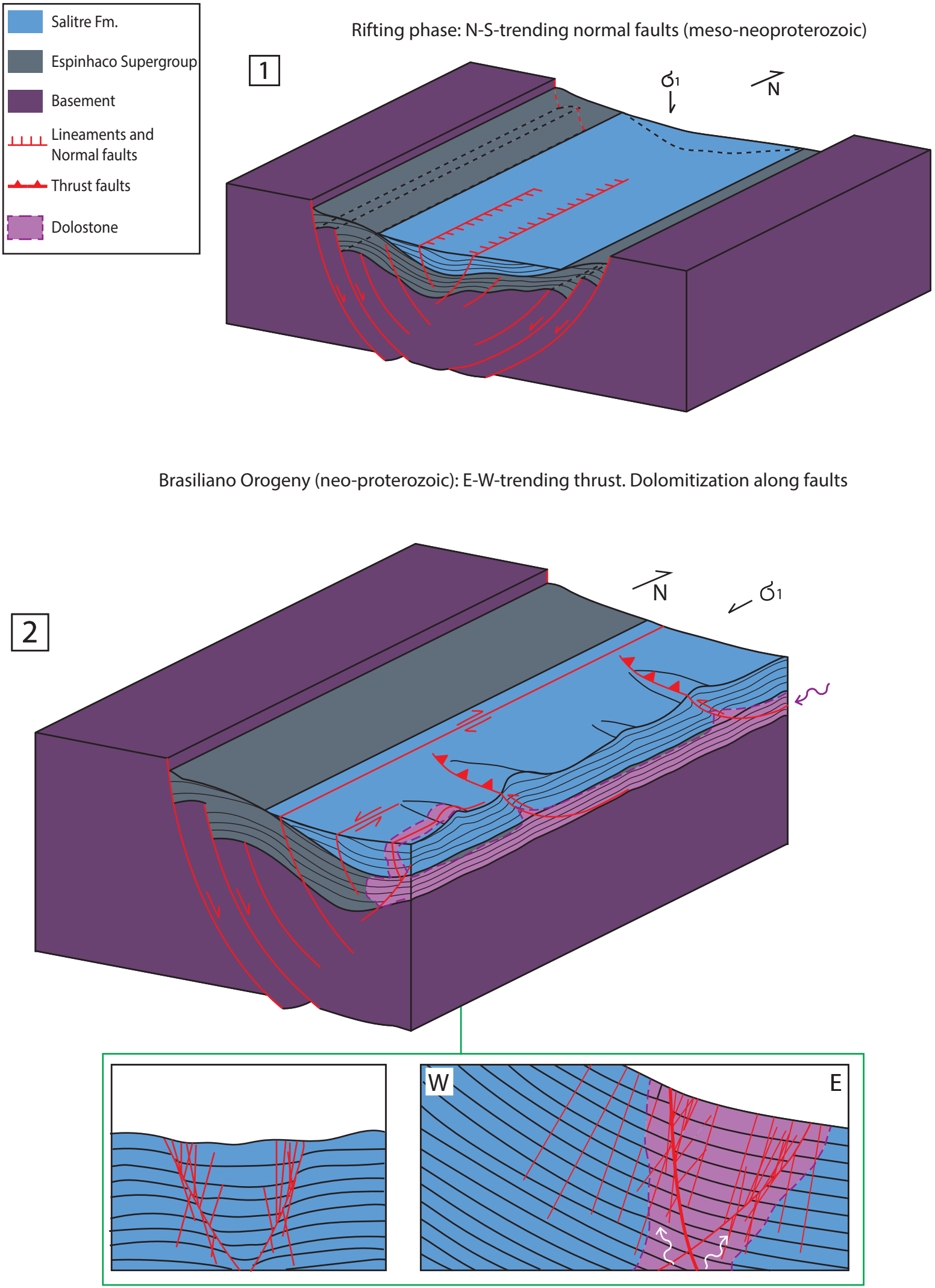
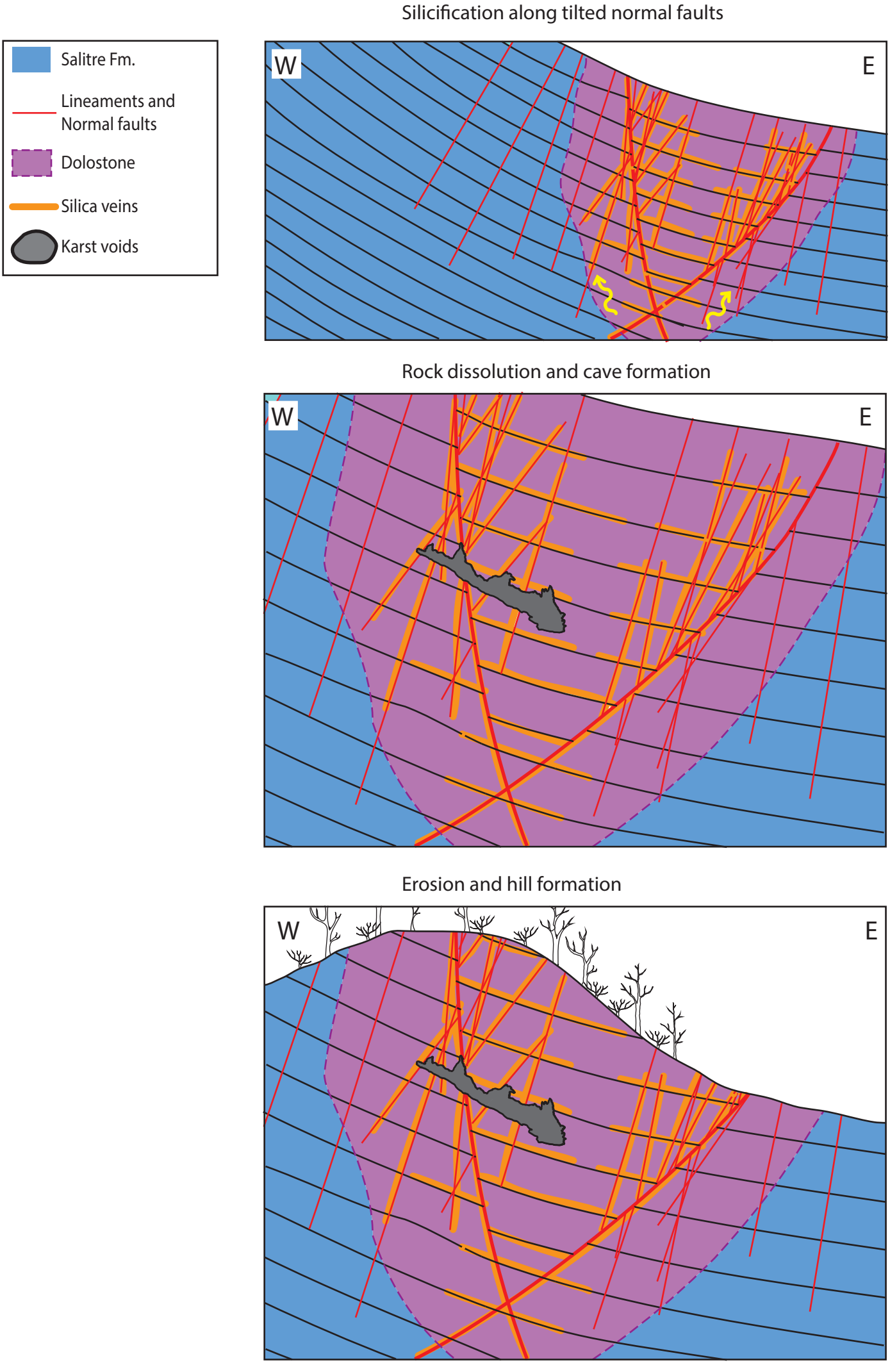
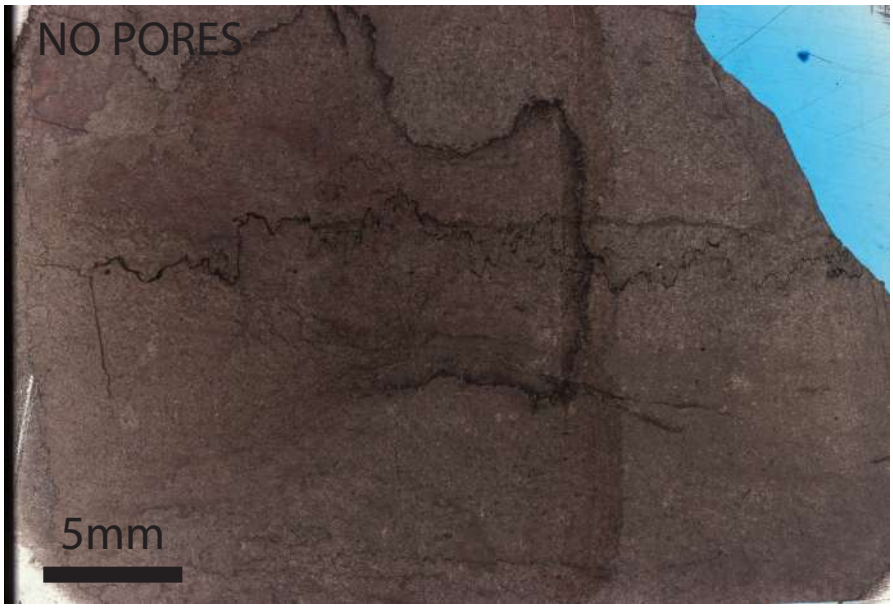
Conceptual Evolutionary Model of Morro Vermelho Cave

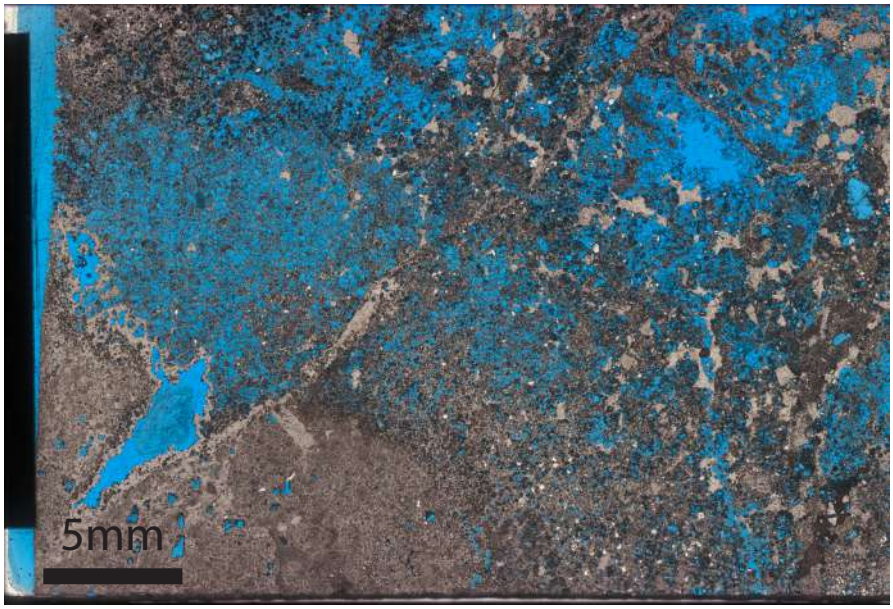



Salitre Fm.
Lineaments and Normal faults
Dolostone
Silica veins
Karst voids
Silicification along tilted normal faults
W
E
Rock dissolution and cave formation
W
E
Erosion and hill formation
W
E

Sample Irece 01: calcite and dolomite (from XRD analysis)

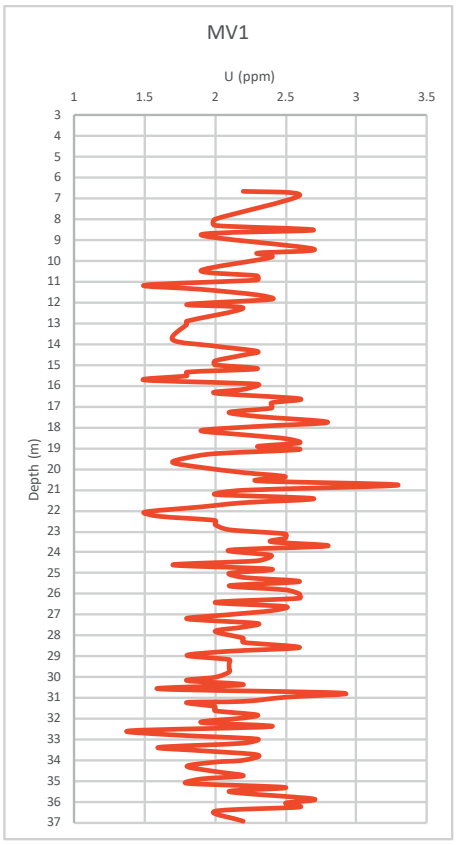


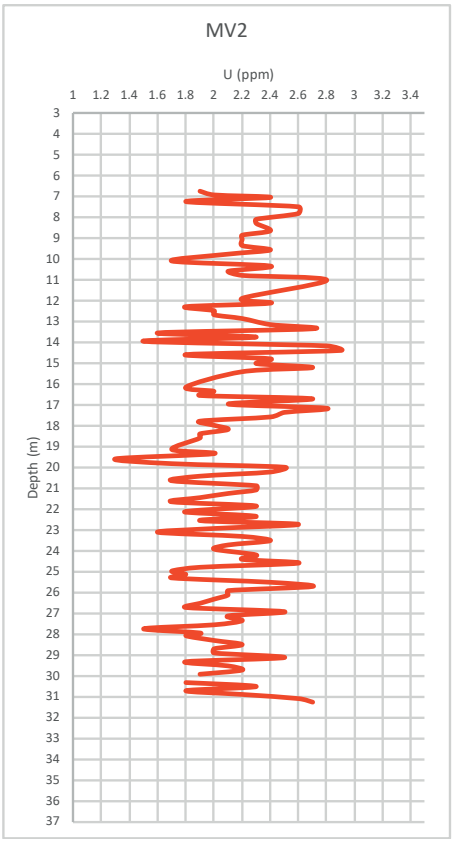
Sample Irece 02: quartz (from XRD analysis)

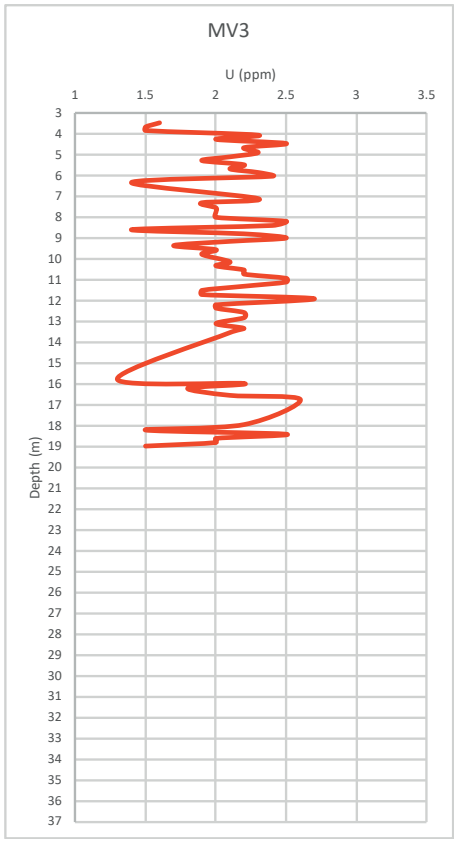


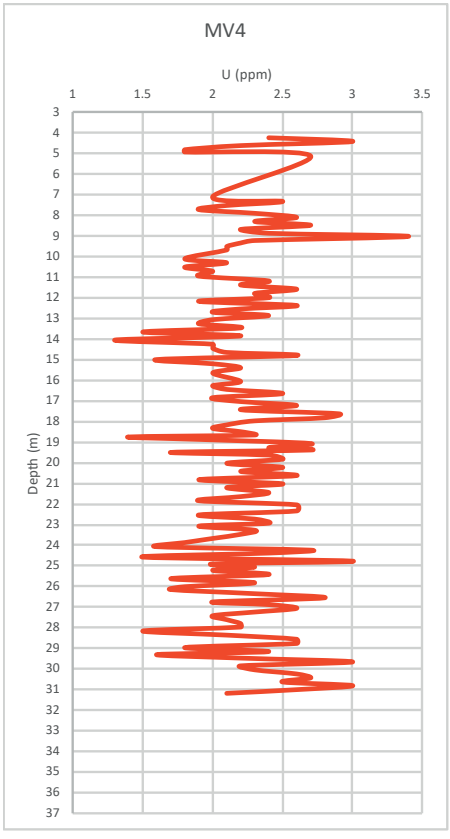
The silicification processes dissolve calcite and dolomite causing an increase of porosity (blue color)

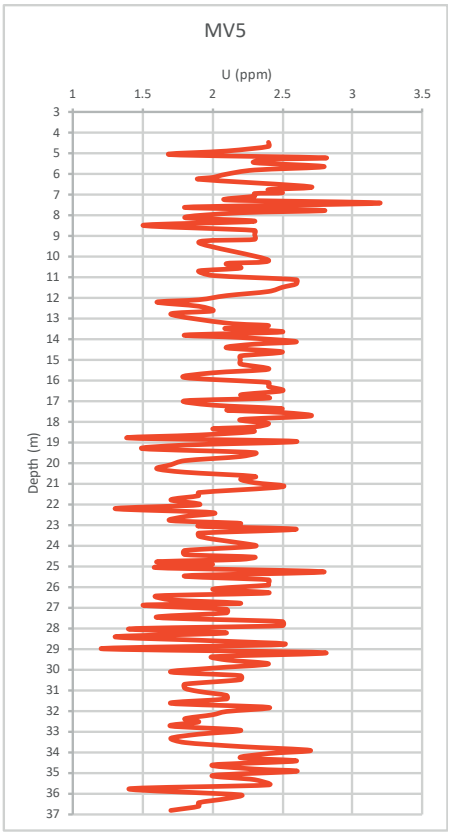
Uranium variation along wells





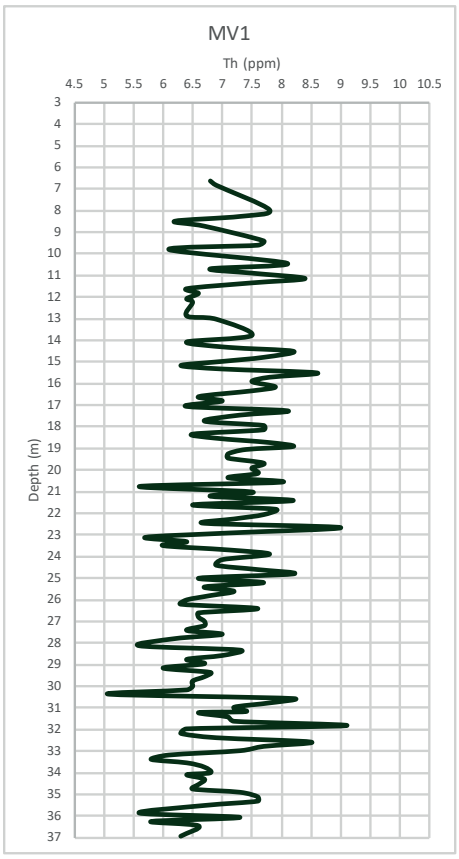


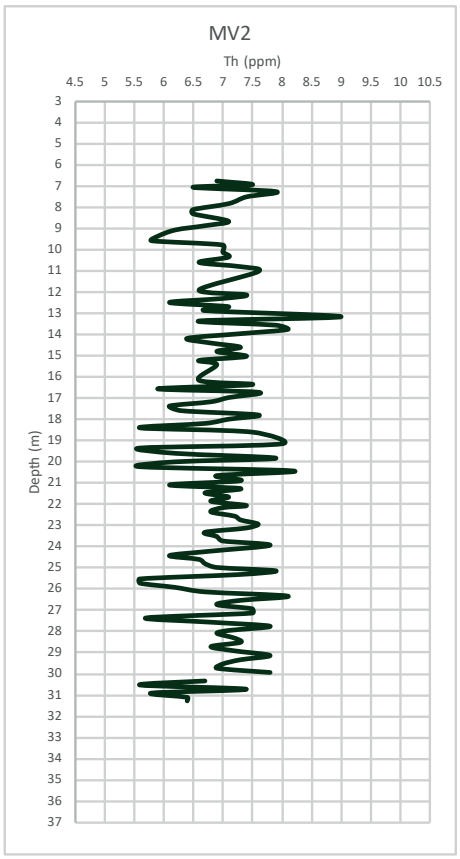


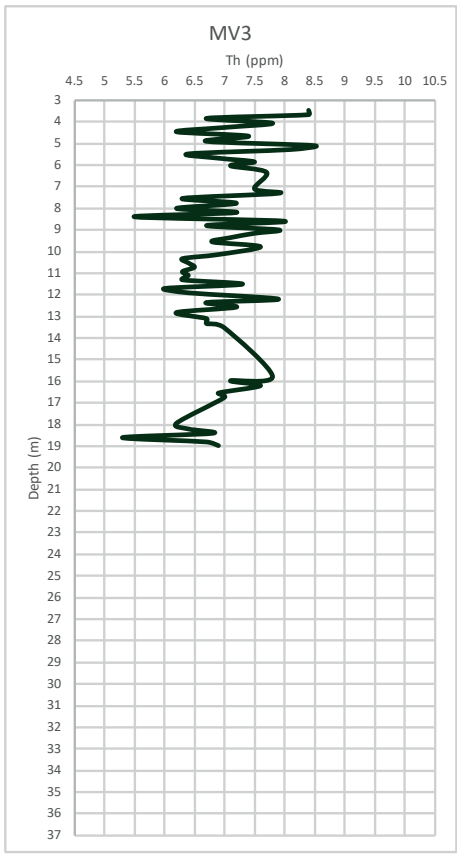


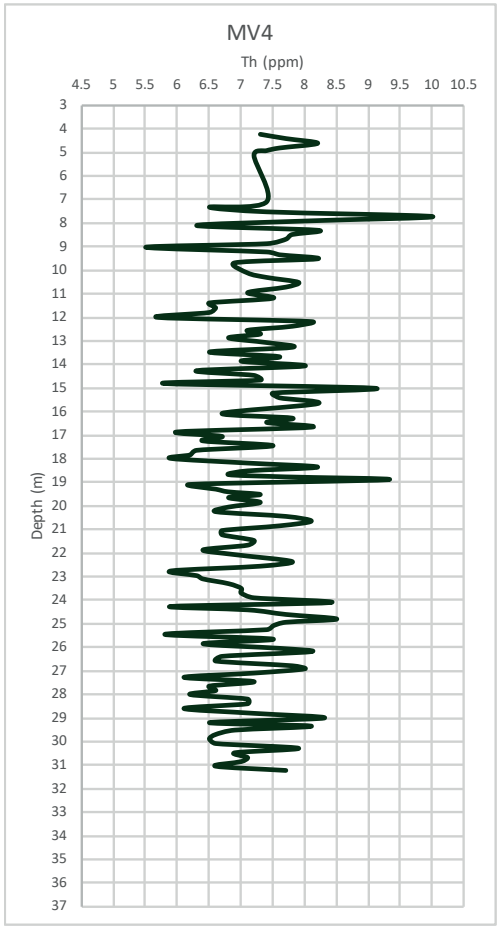
Given a literature-derived value of 2.2 ppm for carbonates and a range of 0.4 ppm for silica (Fertl et al., , 1979), the data from the five wells suggest the occurrence of low dolomitization (in some wells), without evidence of silicification.

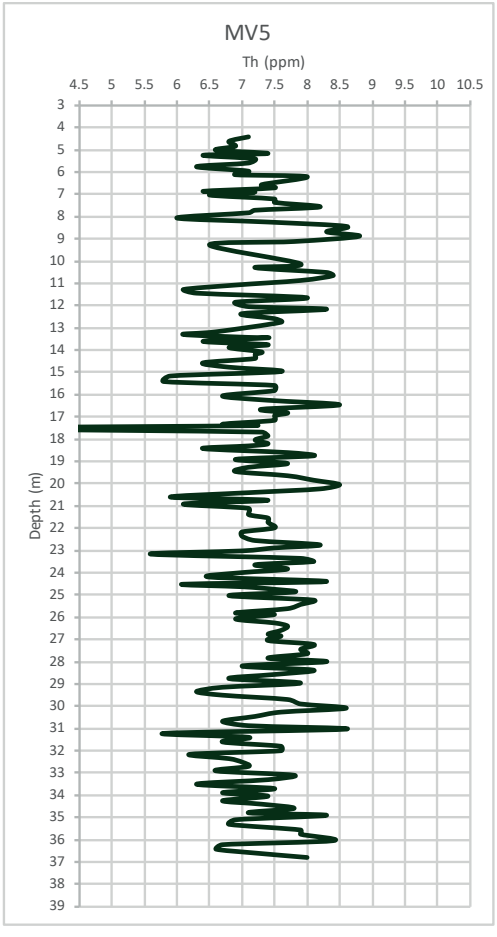
Thorium variation along wells





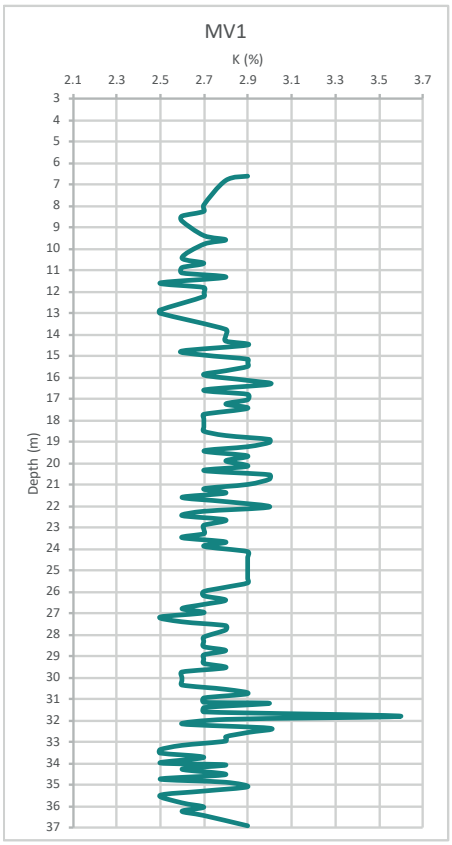


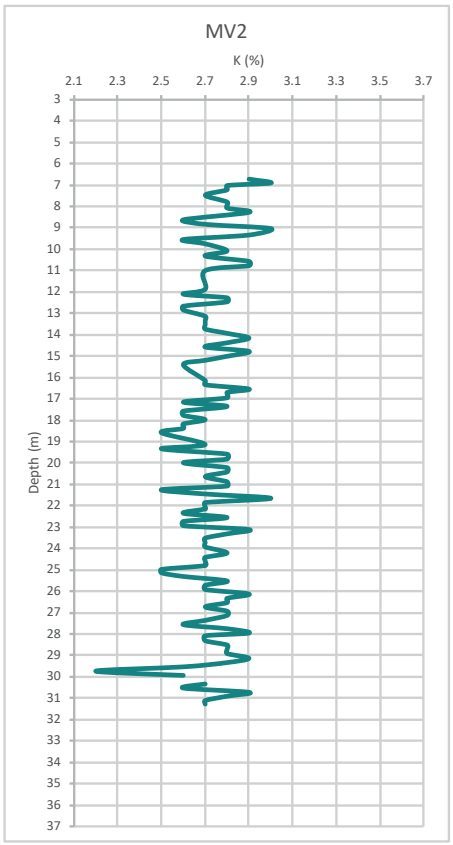


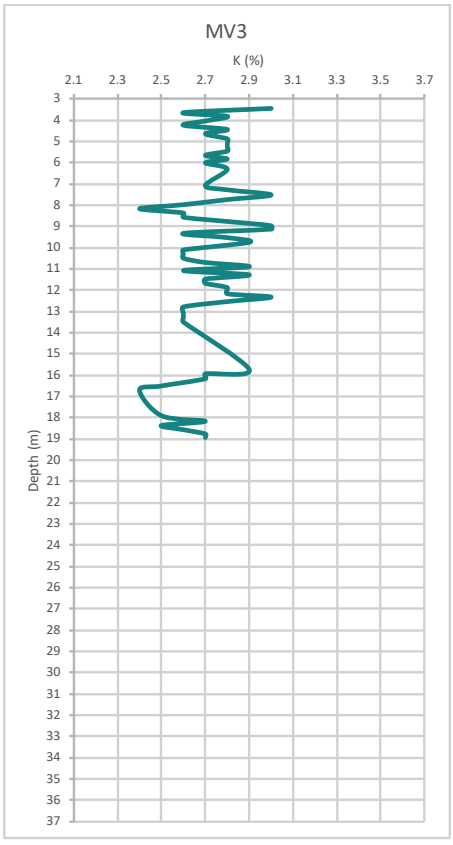


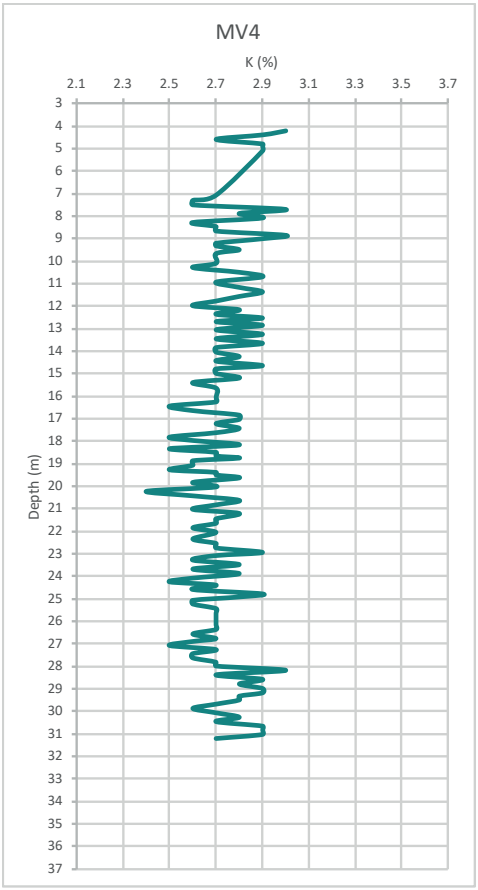
Given a literature-derived value of 7ppm for carbonates and a range of 0.2 ppm for silica (Fertl et al., , 1979), the data from the five wells suggest the occurrence of low dolomitization (in some wells), twithout evidence of silicification.

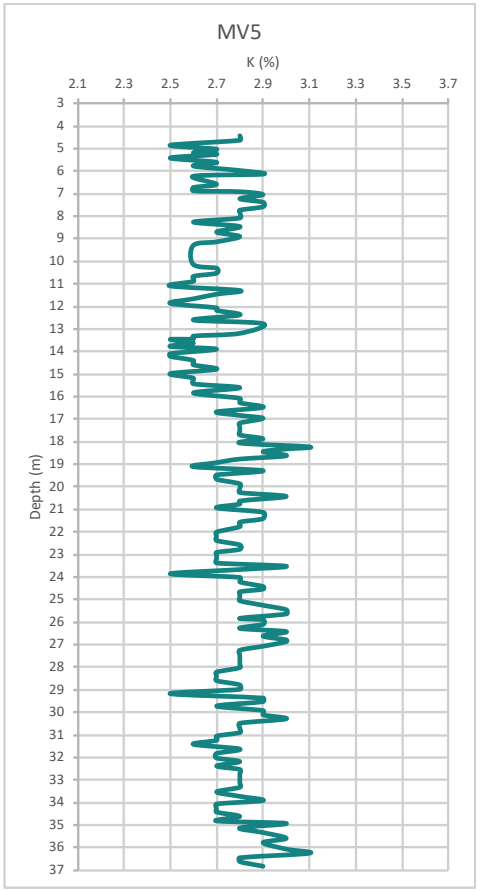
Potassium variation along wells











Given a literature-derived value of 2% for carbonates and a range of 0.15% for silica (Fertl et al., , 1979), the data from the five wells suggest the occurrence of low dolomitization (in some wells), without evidence of silicification.

These findings provide compelling evidence that dolomitization and, in particular, silicification (that modifies rock porosity) were preferentially focused along the cave's fault plane, given their absence in the regional context as indicated by surrounding well data.