Preliminary Geologic Observations and Results

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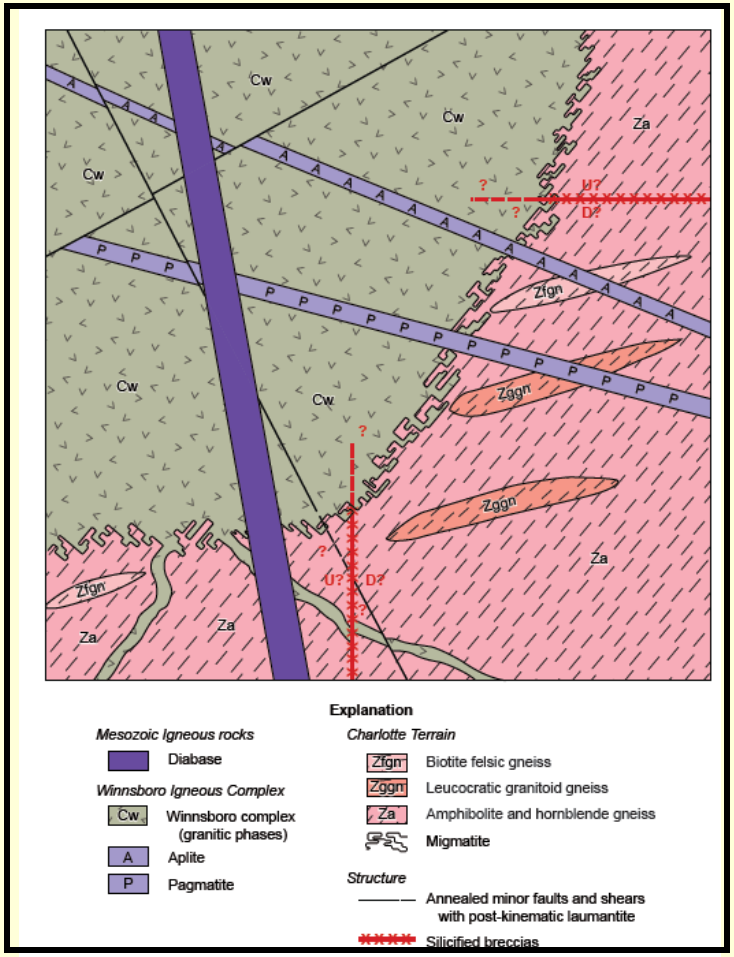
Anticipated Geology Schematic

- Relative ages based on Unit 1 investigations and more recent literature
- Silicified breccias (Wateree Creek Fault) older than Winnsboro pluton (Secor, Personal communication, 2010)
- Basic stratigraphy represented by Charlotte terrane (Late Proterozoic) intruded by Winnsboro igneous complex with late pegmatite and aplite dikes (309 Ma).



Refined Stratigraphy

Thin Section

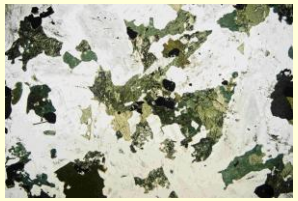
Section chip

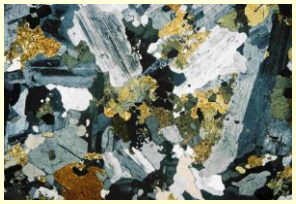
~ 40 mm

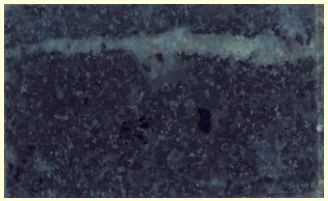
Plane

X-pol

4 mm



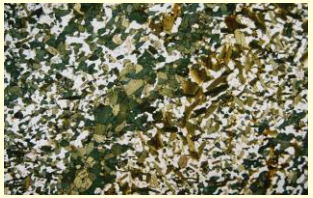


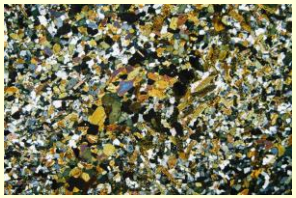


Winnsboro Igneous Complex

Late Phase: **Quartz Monzonite**

Early Phase: **Diorite**

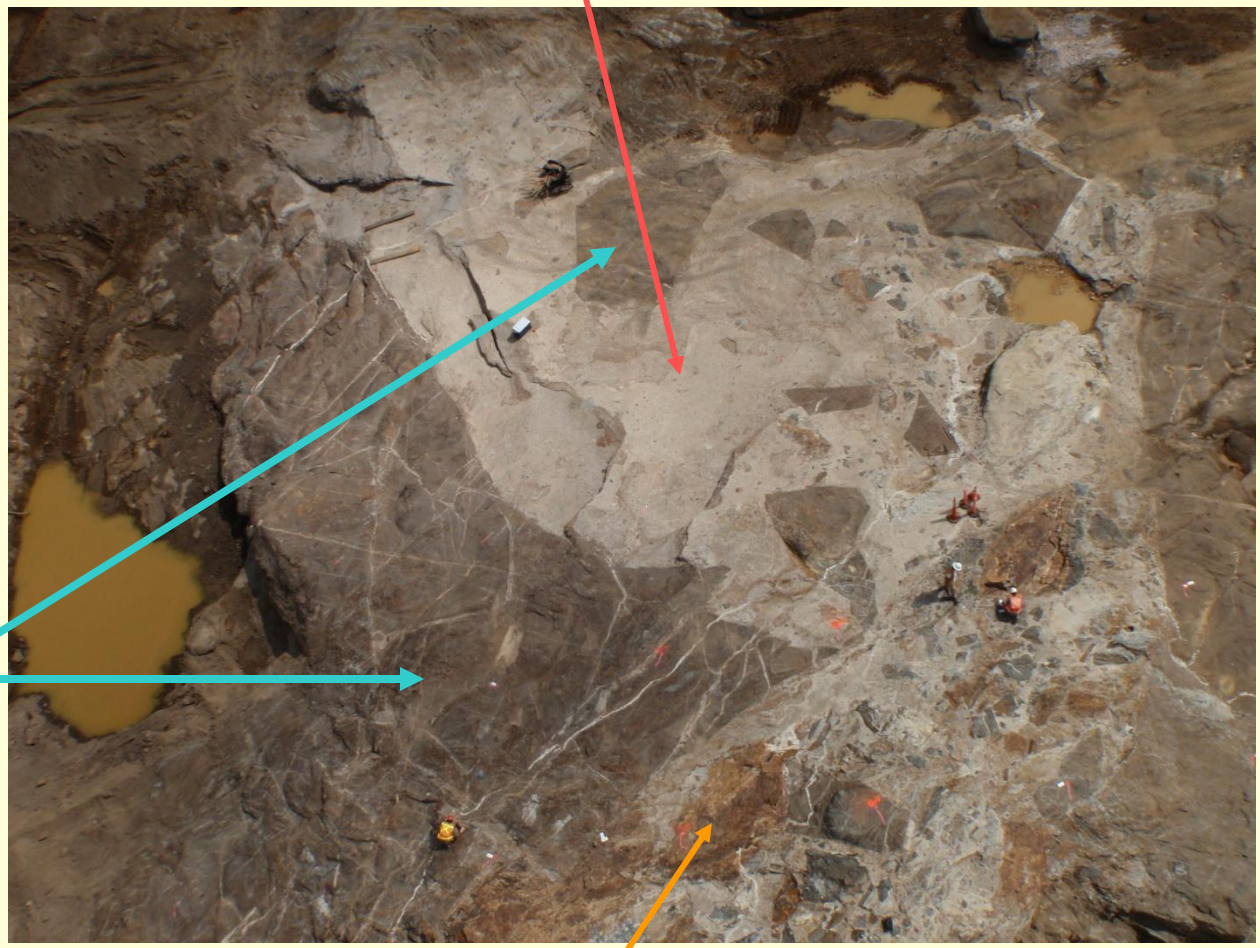




Charlotte Terrane: Primarily Fine grained amphibolite (Za) with subconcordant to discordant bodies of felsic gneiss (Zggn and Zfgn)

Intrusive Relationships

Winnsboro **Late Phase** (Quartz Monzonite)



Winnsboro **Early Phase** (Diorite)

Charlotte Terrane

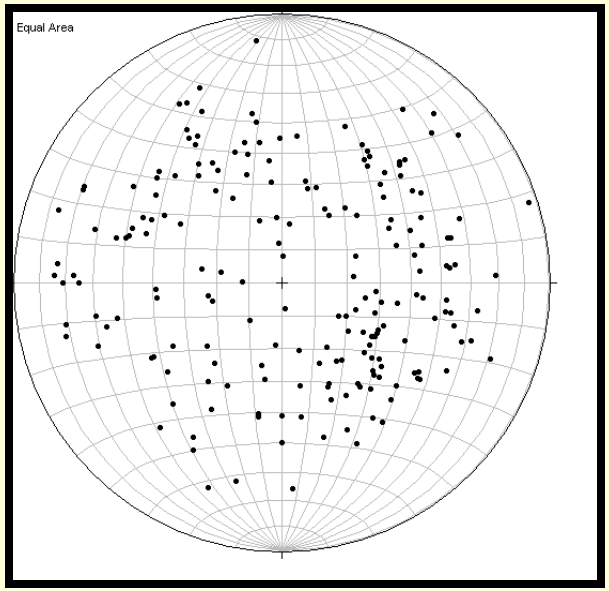
Weathering Profile at top of Excavation

NW Wall – relatively featureless residual soil

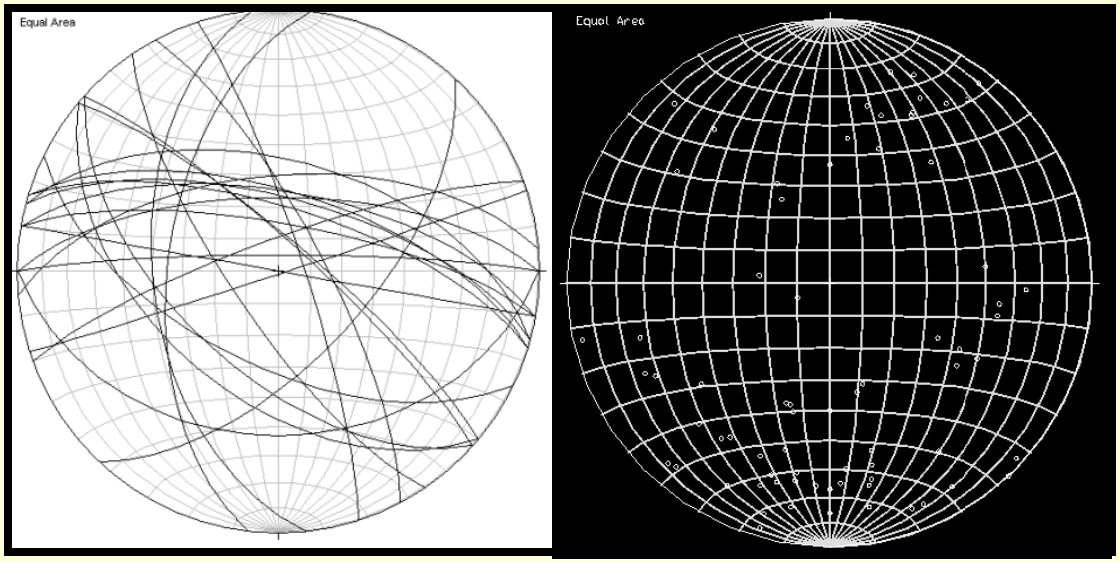
Away from NW top of excavation is deeper into the weathering and structures are preserved in the saprolite

Fractures and Faults

Recon



Unit 2 Excavation

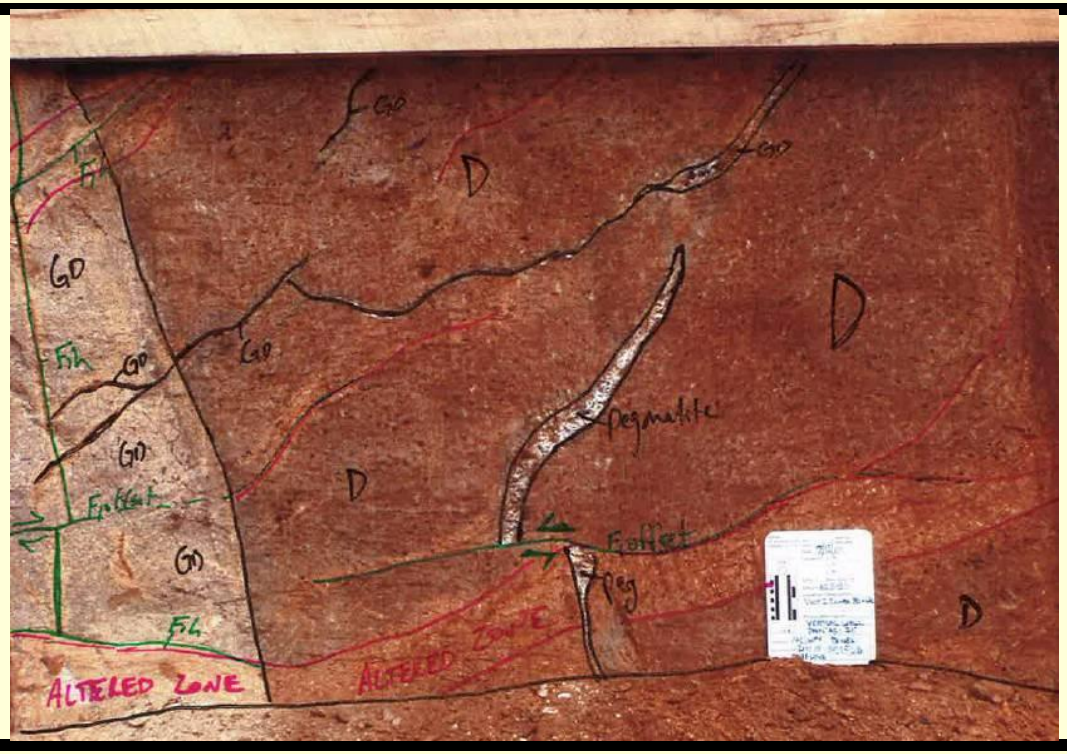


Wide range in orientations

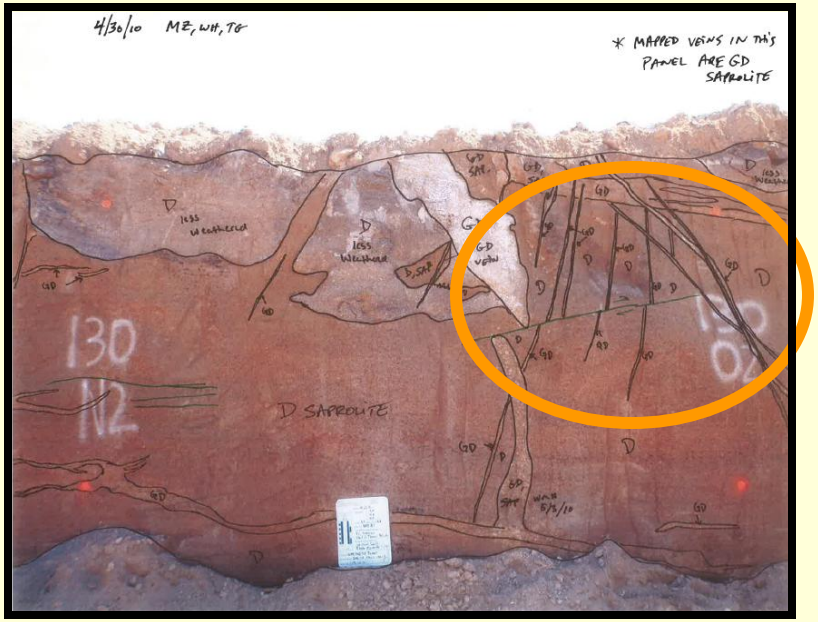
Covered with black amorphous material / probably Mn and Fe oxides

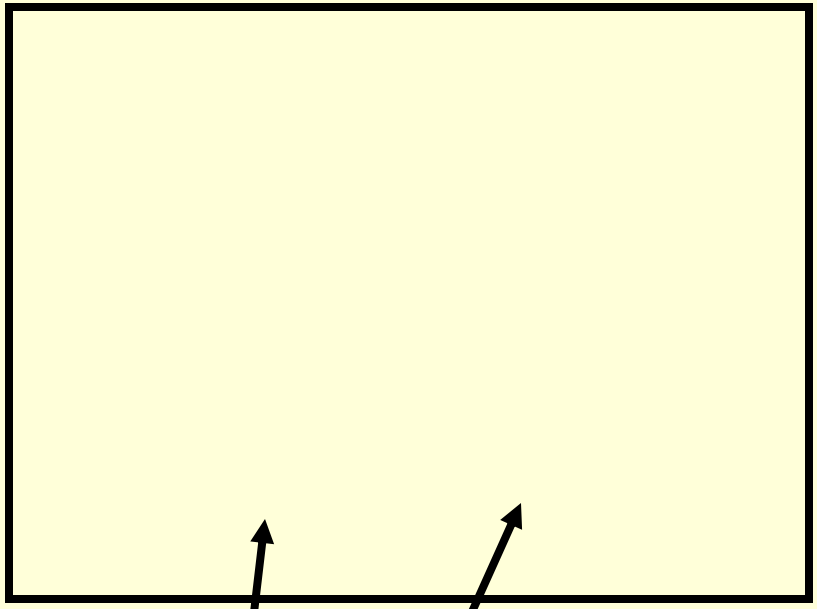
Fractures and Faults

Relative ages with Winnsboro Complex intrusions



Additional Examples





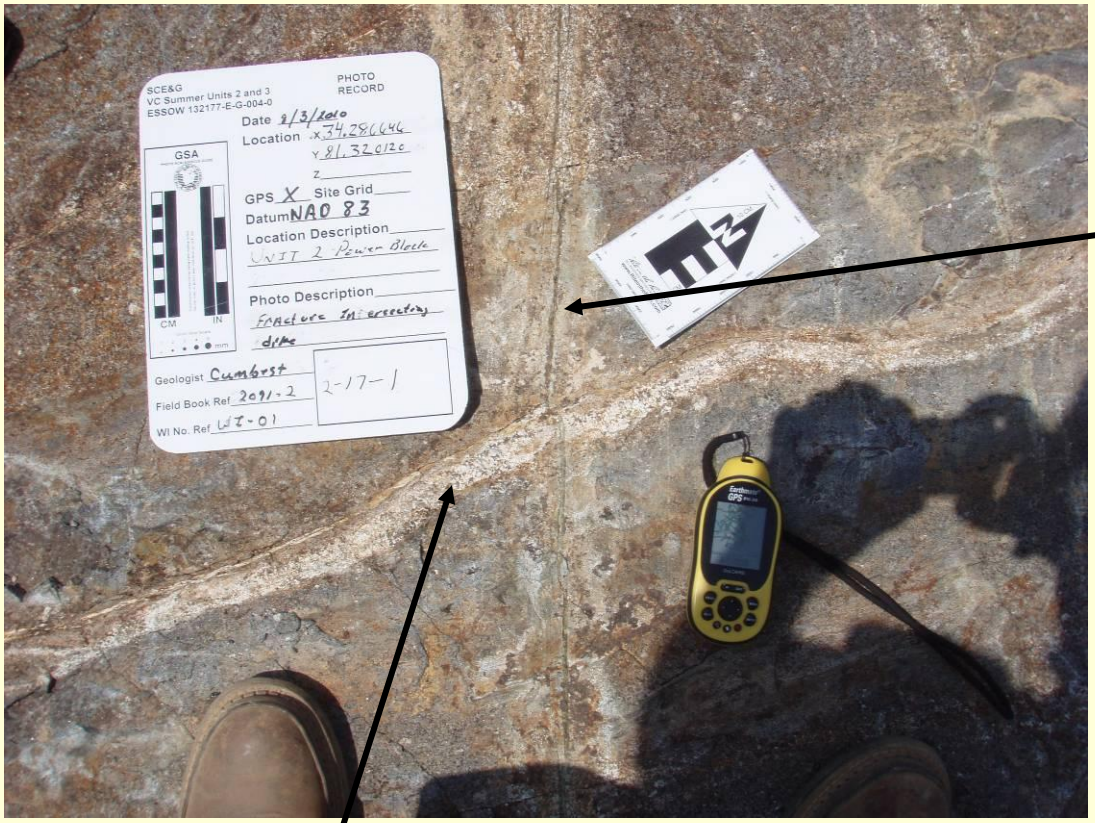
Pegmatite

Preliminary Conclusions

- Winnsboro complex intruded in multiple pulses of diorite followed by quartz monzonite with pegmatite and aplite of multiple generations
- Most of the fracturing and small scale faulting produced by and concurrent with the intrusive process
- Youngest structures are recorded in quartz monzonite

Nuclear Island Exposure

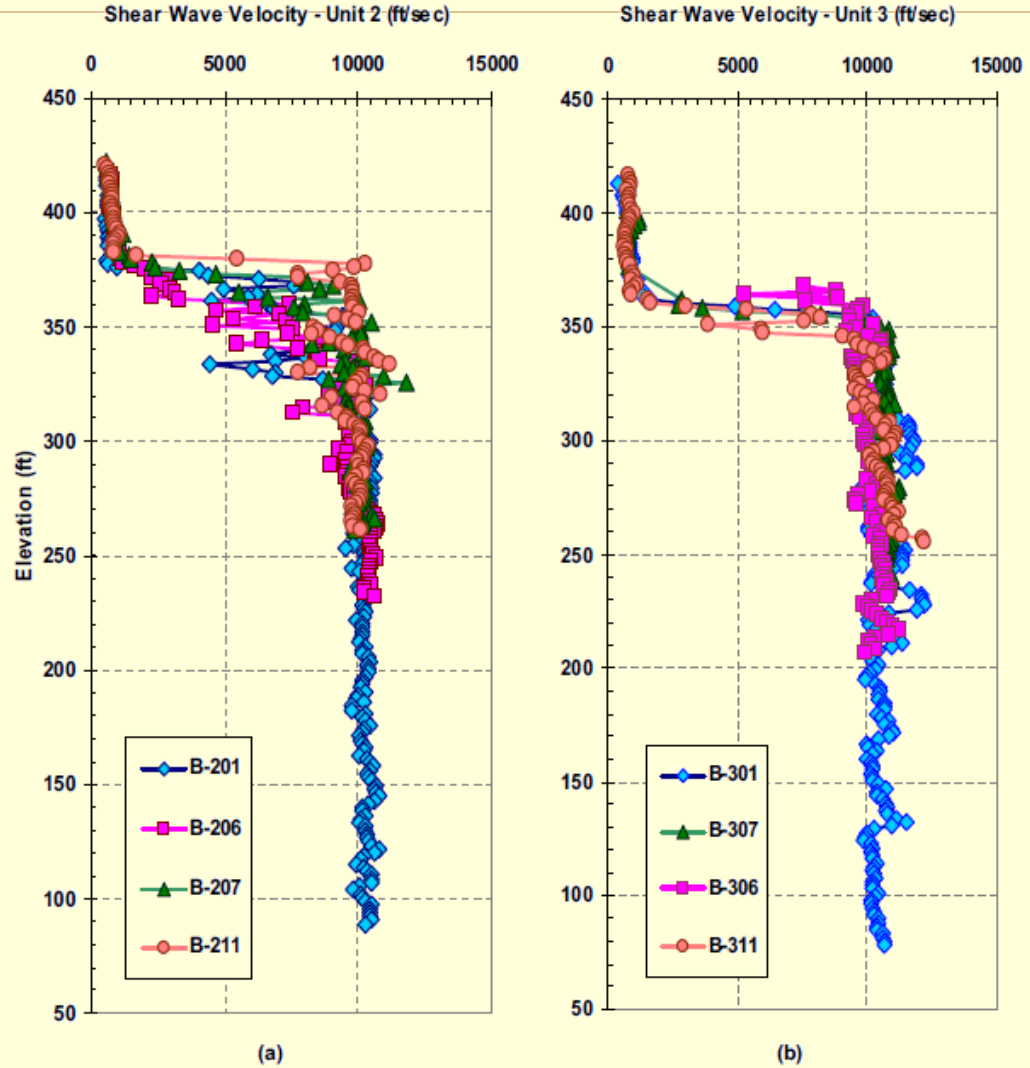
Structures in Quartz Monzonite



Fracture filled with undeformed epidote and chlorite (indicates relatively high temperature formation)

Late pegmatite

Other Issues



Lithologic control on difference in shear wave response between Units 2 and 3 ?

Final Products

- Unit 2 and 3 Excavation Wall and Top of Rock Maps
- ArcScene 3D representation of excavation sequence, retaining wall and geologic surfaces
- Geologic map of surrounding areas based on reconnaissance mapping
- Photo database