### Sand U-Pb Detrital Zircon Geochronology

Detrital zircon age spectra show a Cassiope signal with distinct Tertiary to Cretaceous peaks (Bhatia and Crook 1986). The peaks are modulated by Tertiary peak 1.46 ± 0.09 Ga in the SP sand. This pattern is also observed in the SP sand from the Lake Chaplain, Sultan River, and Youngs–Elwell Creek (40–100 mi²; 104–259 km²). Sediments are distinctly locally derived with minor input from the Mount Persis unit volcanic basin. Some Mount Persis unit volcanic sediments are localized west of the RMFZ–SWIF, suggesting that tectonic rejuvenation may have played a role in controlling the tectonic setting of the Snoqualmie Basin. This rejuvenation initiated in the Oligocene to Miocene and likely resulted from tectonic stresses associated with the RMFZ–SWIF and the RMFZ–SWIF or Monroe fault systems, resulting in locally thick sedimentary basins.

The Monroe synclinal basin hosts a substantial thickness of SP deposits. Northern provenance sediments were deposited during the Oligocene, and it is hypothesized that these sediments were sourced from the Tolt River, Sultan River, and Youngs–Elwell Creek (40–100 mi²; 104–259 km²). Sediments are distinctly locally derived with minor input from the Mount Persis unit volcanic basin. Some Mount Persis unit volcanic sediments are localized west of the RMFZ–SWIF, suggesting that tectonic rejuvenation may have played a role in controlling the tectonic setting of the Snoqualmie Basin. This rejuvenation initiated in the Oligocene to Miocene and likely resulted from tectonic stresses associated with the RMFZ–SWIF and the RMFZ–SWIF or Monroe fault systems, resulting in locally thick sedimentary basins.

- **Sand Provenance**
  - **Sedimentary provenance for most trenched sand**: Skagit River provenance for most trenched sand.
  - **Facies notes**: Sedimentary provenance for most trenched sand: Skagit River provenance.
  - **Geologic unit**: Skagit River provenance for most trenched sand: Skagit River provenance.

### Radiocarbon and OSL/IRSL

New Phaneritic ages support our correlation with nonglacial intervals below Olympia nonglacial intervals. This ancient alluvium is folded and liquified by the Monroe anticline and syncline.

- **Geophysics**
  - **The Monroe Synclinal basin is a major observed nearshore gravity anomaly.**
  - **The Monroe synclinal basin is a major observed nearshore gravity anomaly.**

### Discussion

The dominance of the SP nonglacial strata in the Monroe synclinal basin is not only observed at the sediment surface but also at the regional scale. The Monroe synclinal basin hosts a substantial thickness of SP deposits.

- **Conclusion**
  - **Tertiary Structure of the Monroe Fault**
    - **Tertiary Extension and Later Metamorphism as a Potentially Active Reversed Fault**
    - **Sand Provenance**
      - **Sedimentary provenance and facies notes**: Skagit River provenance for most trenched sand.
      - **Geologic unit**: Skagit River provenance for most trenched sand: Skagit River provenance.

### References

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