

Wrangellia composite terrane

Oligocene

Geologic Map of the Cook Inlet Basin (modified from Finzel et al., 2016) in south-central Alaska. The map

Stratigraphy

Western margin: eastern provenance, Talkeetna Mountains, and a small

Eastern margin: eastern provenance with localized input from the Talkeetna

Western margin: northern provenance with small contribution from eastern

Eastern margin: eastern provenance with small contribution from northern

Eastern margin: eastern provenance and locally incised Triassic-Jurassic bedrock.

Western margin: northern provenance and western Alaska Range.

Figure 2. Late Cretaceous-Quaternary stratigraphic column for the Cook Inlet Basin (Finzel et al., 2017). Inferred

provenance for the Tyonek, Beluga and Sterling formation based on detrital zircon U-Pb dating.

provenance (accretionary prism strata in Chugach Mountains).

shows sample locations for the Tyonek, Sterling, and Beluga Formation samples as well as source terances of interest.

contribution from the northern provenance.

## Comparison between geochronologic and geochemical provenance models for Neogene Cook Inlet Basin strata, south-central Alaska





Alethea Kapolas, Emily Finzel, Kenny Horkley, University of Iowa, Earth & Environmental Sciences Department

Northern Provenance

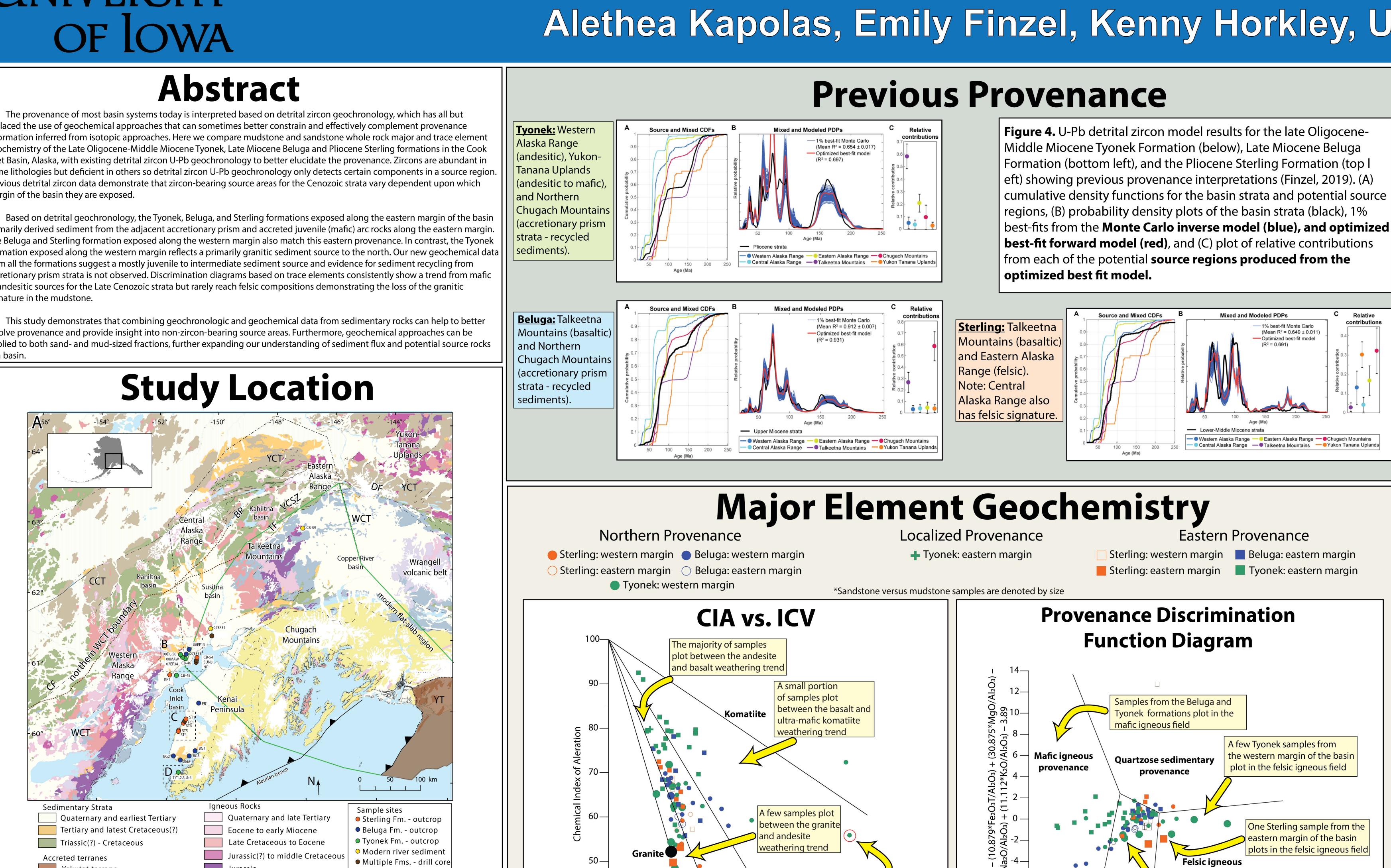
Beluga: eastern margin

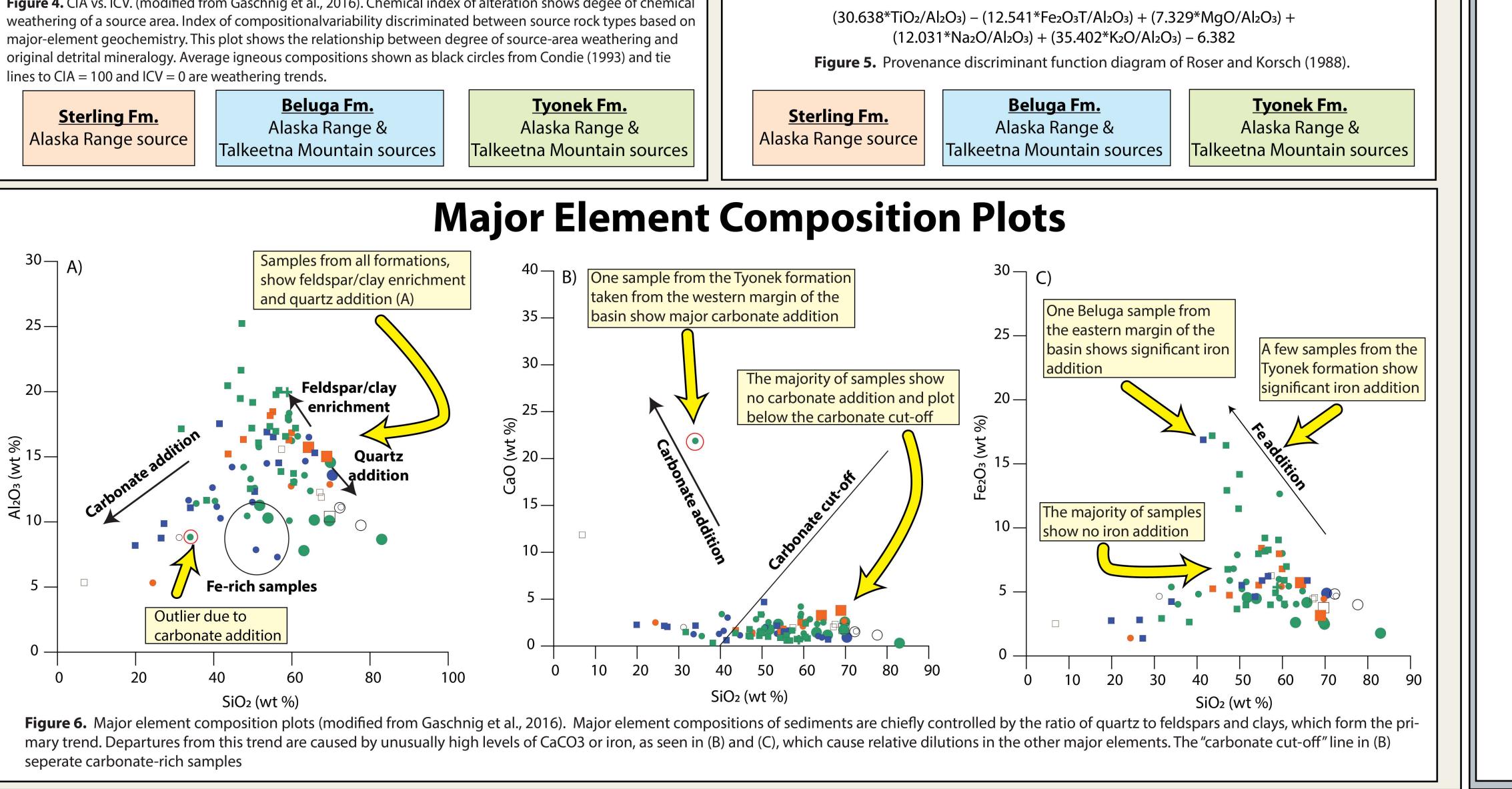
Alaska Range source

Optimized best-fit model (R² = 0.691)

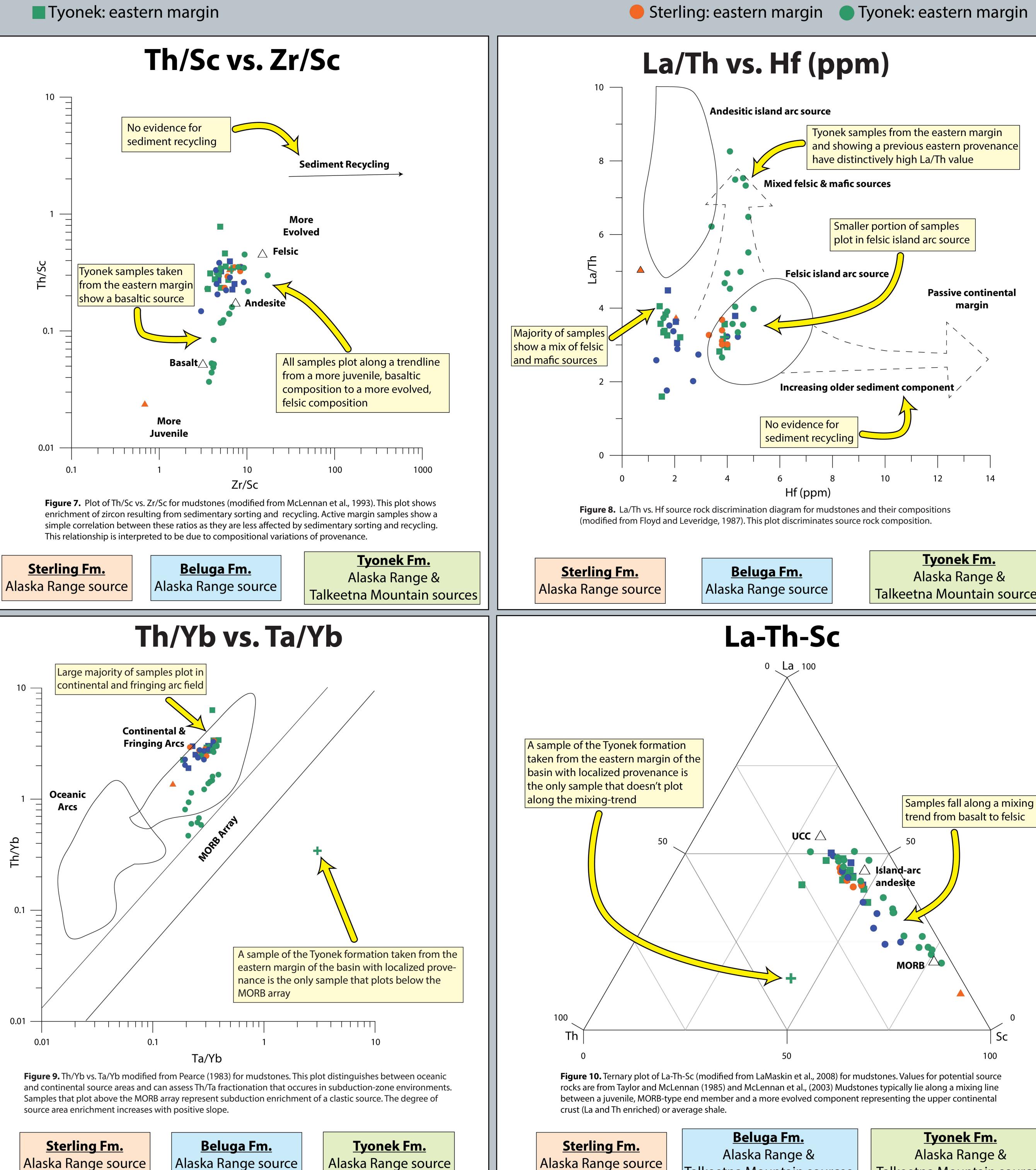
A few Tyonek samples from

One Sterling sample from the





Outlier due to



Alaska Range source

**Trace Element Geochemistry** 

Eastern Provenance

▲ Sterling: western margin ● Beluga: eastern margin

<u>Beluga Fm.</u>

Alaska Range source

La-Th-Sc

UCC /

<u>Beluga Fm.</u>

Alaska Range &

eetna Mountain sources

Tyonek samples from the eastern margin

have distinctively high La/Th value

plot in felsic island arc source

Tyonek Fm.

Alaska Range &

Samples fall along a mixing

trend from basalt to felsion

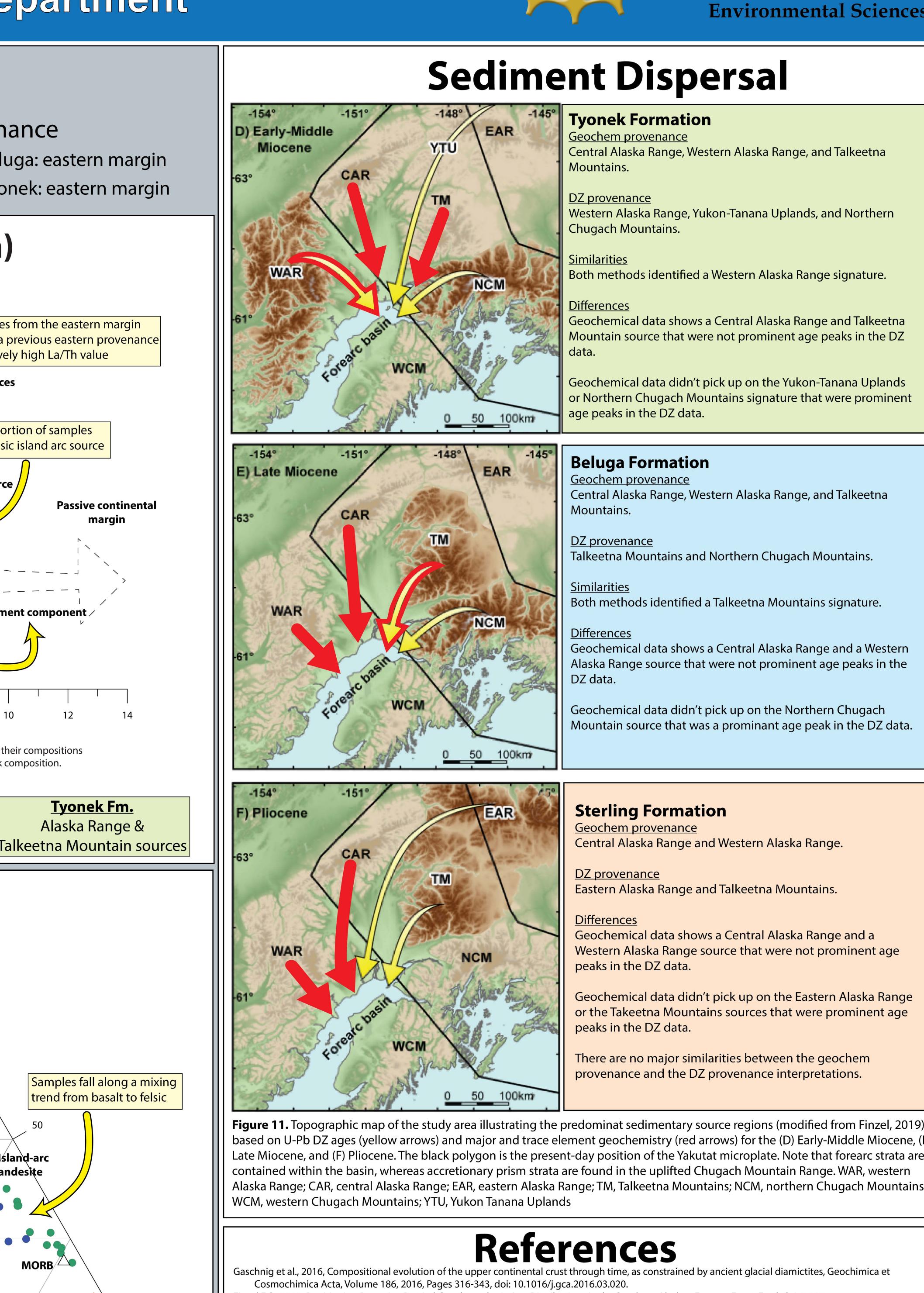
Tyonek Fm.

Alaska Range &

Talkeetna Mountain sources

Localized Provenance

Tyonek: eastern margin



based on U-Pb DZ ages (yellow arrows) and major and trace element geochemistry (red arrows) for the (D) Early-Middle Miocene, ( Late Miocene, and (F) Pliocene. The black polygon is the present-day position of the Yakutat microplate. Note that forearc strata are contained within the basin, whereas accretionary prism strata are found in the uplifted Chugach Mountain Range. WAR, western Alaska Range; CAR, central Alaska Range; EAR, eastern Alaska Range; TM, Talkeetna Mountains; NCM, northern Chugach Mountains

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