

New Geologic Map of the Northern Alaska Peninsula Region of Southwest Alaska

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We have produced a new geologic map of the northern Alaska Peninsula in southwest Alaska using new and archival materials as part of a project to create national databases of geological, geochemical, geophysical, and mineral-deposit data. Digital methods were used to facilitate a state-wide synthesis and creation of a rich database of geologic attributes based on a uniform data structure and attribution scheme. The northern Alaska Peninsula map covers all or part of six 1:250,000-scale quadrangles, including new bedrock and surficial geologic mapping of the Taylor Mountains and Dillingham quadrangles. We also updated previously published maps, assigning new age or stratigraphic positions to some units and attempted to separate Tertiary and Jurassic volcanic rocks in the area immediately west of the Alaska Range.

Important new interpretations derived as a result of this effort include recognition of 3 distinct geologic domains or provinces that have been joined since at least Cretaceous time, all intruded by 60 to 70 Ma plutons. On the basis of geologic and geophysical data, we have demonstrated that the so-called Mulchatna fault is probably not a fault, although we can not yet explain the cause for the linear feature along the Mulchatna River. Surficial mapping on the west side of Cook Inlet, east of the Alaska Range, shows evidence for rapid uplift and alluviation, resulting in a deltaic features, including natural levees which are rarely recognized in Alaska. In addition, during early Pleistocene time, a major glacial lake system was dammed behind massive glaciers derived from the Alaska Range on the east and the Ahklun Mountains on the west.

We recorded geologic data for this map in a system of spatial and text databases which allow production and analysis of specialized or derivative maps. The data contain brief unit descriptions, the geologic unit assigned from original published sources where previous mapping was available, and the source information. Additional attributes correlate geologic units to adjacent quadrangles and can be linked through related files to labels, colors, lithology, and age for each unit. Other attributes describe the nature of contact relationships between units.