Introduction

Turnagain Arm, just east of Anchorage, provides a readily accessible, world-class cross section through a Mesozoic accretionary wedge. Nearly continuous exposures along the Seward Highway, the Alaska Railroad, and the shoreline of Turnagain Arm display the two main constituent units of the Chugach terrane: the McHugh Complex and Valdez Group. In this paper we describe seven bedrock geology stops along Turnagain Arm, and two others in the Chugach Mountains just to the north (Stops 1-7 and 9), which will be visited as part of the May, 1997 field trip of the Alaska Geological Society. Outcrops along Turnagain Arm have already been described in two excellent guidebook articles (Clark, 1981; Winkler and others 1984), both of which remain as useful and valid today as when first published. Since the early 1980's, studies along Turnagain Arm have addressed radiolarian ages of chert and conodont ages of limestone in the McHugh Complex (Nelson and others, 1986, 1987); geochemistry of basalt in the McHugh Complex (Nelson and Blome, 1991); post-accretion brittle faulting (Bradley and Kusky, 1990; Kusky and others, 1997); and the age and tectonic setting of gold mineralization (Haeussler and others, 1995). Highlights of these newer findings will described both in the text below, and in the stop descriptions.

Superb exposures along the southeastern shore of Kachemak Bay show several other features of the McHugh Complex that are either absent or less convincing along Turnagain Arm. While none of these outcrops can be reached via the main road network, they are still reasonably accessible — all are within an hour by motorboat from Homer, seas permitting. Here, we describe seven outcrops along the shore of Kachemak Bay that we studied between 1989 and 1993 during geologic mapping of the Seldovia 1:250,000-scale quadrangle. These outcrops (Stops 61-67) will not be part of the 1997 itinerary, but are included here for the benefit of those who may wish to visit them later.

The Chugach Terrane

Alaska's Pacific margin is underlain by two parallel composite terranes — the Wrangellia composite terrane (consisting of the Peninsular, Wrangellia, and Alexander terranes), and farther outboard, the Chugach-Prince William composite terrane. During much of the Mesozoic, the two formed a magmatic arc and accretionary wedge, respectively, above a circum-Pacific subduction zone. The Border Ranges Fault forms the boundary between the two composite terranes; it began as a subduction thrust but has been reactivated in various places as a strike-slip or normal fault (for example, Little and Naeser, 1989). The rocks described here are part of the Chugach terrane (fig. 1), the name given to the Mesozoic part of the accretionary wedge.