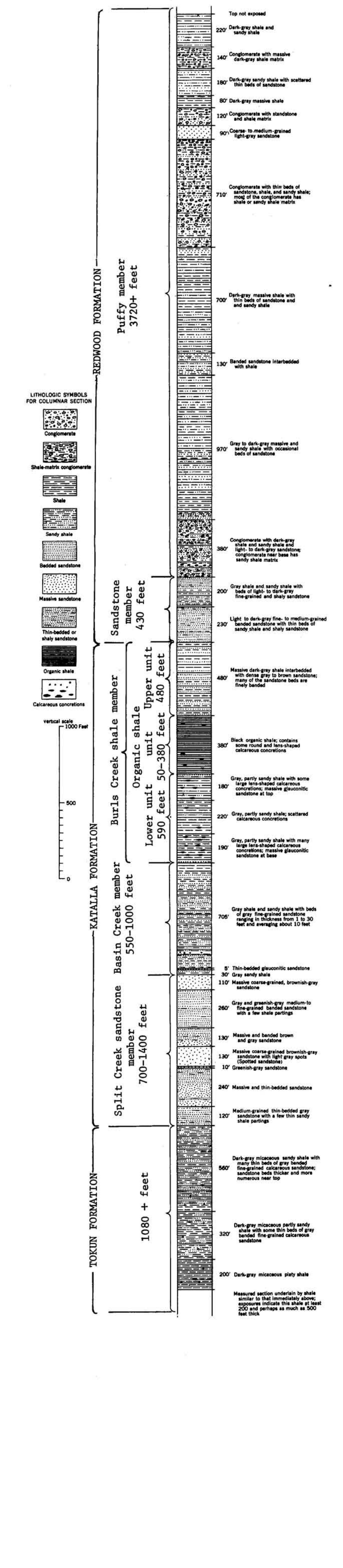


Geologic map and section of the central part of the Katalpa district, Alaska

GENERALIZED COMPOSITE COLUMNAR SECTION OF THE TERTIARY SEDIMENTARY ROCKS EXPOSED IN THE KATALPA AREA



Don J. Miller

This map of the central part of the Katalpa district is one of a series showing the geology of the Gulf of Alaska Tertiary province. The member part of the province is made up of an arcuate belt more than 300 miles (485 km) long and 2 to 40 miles (3.2 to 64.0 km) wide in which Tertiary sedimentary rocks are exposed or are underlain by lowland areas covered by unconsolidated surficial deposits or ice (Parker, 1961, 1971). Field studies were carried out intensively by Miller and others in the central Katalpa district from 1948 to 1958 as part of the Geological Survey's continuing efforts to evaluate the petroleum and coal resources of southern Alaska. Results of investigations in the Katalpa district have been made available in preliminary open-file reports (Miller, 1952, 1953). This map assembles available geologic data on the geology and critical areas in a standard U. S. Geological Survey publication, makes minor modifications on the basis of newer data, and formally describes or redefines mappable rock units of Tertiary age.

REDBOOD FORMATION

The stratigraphic sequence exposed in the central part of the Katalpa district includes more than 6,000 feet (1,830 m) of apparently conformable bedded marine sedimentary and volcanic rocks of probable late Eocene through Miocene age. The beds, which are 2 to 40 feet (0.6 to 12.2 m) thick, are made up of sandstone, siltstone, and shale. The Redwood Formation is composed of the upper part of the Tokun Formation and the lower part of the Katalpa Formation. The Tokun Formation is composed of the upper part of the Tokun Formation and the lower part of the Katalpa Formation. The Katalpa Formation is composed of the upper part of the Tokun Formation and the lower part of the Katalpa Formation.

Basin Creek shale member

The Basin Creek shale member is a thin, shaly unit that is 10 to 20 feet (3 to 6 m) thick. It is composed of dark gray to black shaly sandstone and siltstone. The member is named after the Basin Creek, which flows through the area. The shale is highly fossiliferous and contains many small shells and other marine organisms.

Spilt Creek sandstone member

The Spilt Creek sandstone member is a thick, sandy unit that is 700 to 1,400 feet (213 to 427 m) thick. It is composed of light gray to tan sandstone and siltstone. The sandstone is well-sorted and contains many small pebbles and shells. The member is named after the Spilt Creek, which flows through the area.

Organic shale member

The Organic shale member is a thin, shaly unit that is 590 feet (180 m) thick. It is composed of dark gray to black shaly sandstone and siltstone. The shale is highly fossiliferous and contains many small shells and other marine organisms.

Lower unit

The Lower unit is a thin, shaly unit that is 0 to 380 feet (0 to 116 m) thick. It is composed of dark gray to black shaly sandstone and siltstone. The shale is highly fossiliferous and contains many small shells and other marine organisms.

Don Miller Hills

The Don Miller Hills are a range of hills that are 1,080 feet (330 m) high. They are composed of dark gray to black shaly sandstone and siltstone. The hills are named after Don Miller, who discovered them in 1952.

In Michael Miller's Basin Creek Member includes much more fragmental volcanic material. In part water-laid and interbedded with sandstone and siltstone and in part at irregularly roughly cylindrical blocks that show some intrusive relations. The volcanic material is described by Miller (1952, p. 772-780, fig. 1427) as a facies of basalt, but this basalt consists of the dark gray to black shaly sandstone and siltstone. The volcanic material is described by Miller (1952, p. 772-780, fig. 1427) as a facies of basalt, but this basalt consists of the dark gray to black shaly sandstone and siltstone.

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INTEGRITY

The characteristic pattern of folding in the Tertiary rocks of the south-central Katalpa district is one of closely spaced and tightly compressed anticlines and synclines of equal width and small lateral extent. Most of the folds are asymmetric or overturned, with the axial planes dipping north or west. Deformations to the north or west have been recognized at a few places in the eastern part of the area. Bedding dips steeper than 60° (including overturned dips) are more common than dips of 30° or less. All faults on which the strata could be determined with any degree of certainty dip steeply north or west or are vertical. The west or north-westward movement on many of the faults, but in some faults either the opposite sense of dip-slip displacement or a large component of lateral displacement is indicated.

The structure of the Don Miller Hills area, including the parts north of Spilt Creek and south of the Katalpa Hill field, may be described generally as a southeast-plunging syncline in which the superimposed Tertiary folds trend north-south or slightly west of north. A north-south-trending ridge may be traced in the vicinity of the Tokun Formation. It is represented by an abrupt change in the plunge of north-trending folds along the east foot of the ridge, or by areas in which the prevailing strike is east-west in the ridge between Point Hey and Redwood Creek. As shown by the structure sections (A-A' through E-E') the intensity of folding and the shape of the folds and attitude of their axial planes vary greatly, but also along the axis of individual folds. Folds measured in the Spilt Creek Sandstone Member at approximately equal distance from the axis of the relatively large fold are: (1) a small fold with a dip of 30° to 40°; (2) a larger fold with a dip of 40° to 50°; (3) a still larger fold with a dip of 50° to 60°; (4) a still larger fold with a dip of 60° to 70°; (5) a still larger fold with a dip of 70° to 80°; (6) a still larger fold with a dip of 80° to 90°; (7) a still larger fold with a dip of 90° to 100°; (8) a still larger fold with a dip of 100° to 110°; (9) a still larger fold with a dip of 110° to 120°; (10) a still larger fold with a dip of 120° to 130°; (11) a still larger fold with a dip of 130° to 140°; (12) a still larger fold with a dip of 140° to 150°; (13) a still larger fold with a dip of 150° to 160°; (14) a still larger fold with a dip of 160° to 170°; (15) a still larger fold with a dip of 170° to 180°; (16) a still larger fold with a dip of 180° to 190°; (17) a still larger fold with a dip of 190° to 200°; (18) a still larger fold with a dip of 200° to 210°; (19) a still larger fold with a dip of 210° to 220°; (20) a still larger fold with a dip of 220° to 230°; (21) a still larger fold with a dip of 230° to 240°; (22) a still larger fold with a dip of 240° to 250°; (23) a still larger fold with a dip of 250° to 260°; (24) a still larger fold with a dip of 260° to 270°; (25) a still larger fold with a dip of 270° to 280°; (26) a still larger fold with a dip of 280° to 290°; (27) a still larger fold with a dip of 290° to 300°; (28) a still larger fold with a dip of 300° to 310°; (29) a still larger fold with a dip of 310° to 320°; (30) a still larger fold with a dip of 320° to 330°; (31) a still larger fold with a dip of 330° to 340°; (32) a still larger fold with a dip of 340° to 350°; (33) a still larger fold with a dip of 350° to 360°; (34) a still larger fold with a dip of 360° to 370°; (35) a still larger fold with a dip of 370° to 380°; (36) a still larger fold with a dip of 380° to 390°; (37) a still larger fold with a dip of 390° to 400°; (38) a still larger fold with a dip of 400° to 410°; (39) a still larger fold with a dip of 410° to 420°; (40) a still larger fold with a dip of 420° to 430°; (41) a still larger fold with a dip of 430° to 440°; (42) a still larger fold with a dip of 440° to 450°; (43) a still larger fold with a dip of 450° to 460°; (44) a still larger fold with a dip of 460° to 470°; (45) a still larger fold with a dip of 470° to 480°; (46) a still larger fold with a dip of 480° to 490°; (47) a still larger fold with a dip of 490° to 500°; (48) a still larger fold with a dip of 500° to 510°; (49) a still larger fold with a dip of 510° to 520°; (50) a still larger fold with a dip of 520° to 530°; (51) a still larger fold with a dip of 530° to 540°; (52) a still larger fold with a dip of 540° to 550°; (53) a still larger fold with a dip of 550° to 560°; (54) a still larger fold with a dip of 560° to 570°; (55) a still larger fold with a dip of 570° to 580°; (56) a still larger fold with a dip of 580° to 590°; (57) a still larger fold with a dip of 590° to 600°; (58) a still larger fold with a dip of 600° to 610°; (59) a still larger fold with a dip of 610° to 620°; (60) a still larger fold with a dip of 620° to 630°; (61) a still larger fold with a dip of 630° to 640°; (62) a still larger fold with a dip of 640° to 650°; (63) a still larger fold with a dip of 650° to 660°; (64) a still larger fold with a dip of 660° to 670°; (65) a still larger fold with a dip of 670° to 680°; (66) a still larger fold with a dip of 680° to 690°; (67) a still larger fold with a dip of 690° to 700°; (68) a still larger fold with a dip of 700° to 710°; (69) a still larger fold with a dip of 710° to 720°; (70) a still larger fold with a dip of 720° to 730°; (71) a still larger fold with a dip of 730° to 740°; (72) a still larger fold with a dip of 740° to 750°; (73) a still larger fold with a dip of 750° to 760°; (74) a still larger fold with a dip of 760° to 770°; (75) a still larger fold with a dip of 770° to 780°; (76) a still larger fold with a dip of 780° to 790°; (77) a still larger fold with a dip of 790° to 800°; (78) a still larger fold with a dip of 800° to 810°; (79) a still larger fold with a dip of 810° to 820°; (80) a still larger fold with a dip of 820° to 830°; (81) a still larger fold with a dip of 830° to 840°; (82) a still larger fold with a dip of 840° to 850°; (83) a still larger fold with a dip of 850° to 860°; (84) a still larger fold with a dip of 860° to 870°; (85) a still larger fold with a dip of 870° to 880°; (86) a still larger fold with a dip of 880° to 890°; (87) a still larger fold with a dip of 890° to 900°; (88) a still larger fold with a dip of 900° to 910°; (89) a still larger fold with a dip of 910° to 920°; (90) a still larger fold with a dip of 920° to 930°; (91) a still larger fold with a dip of 930° to 940°; (92) a still larger fold with a dip of 940° to 950°; (93) a still larger fold with a dip of 950° to 960°; (94) a still larger fold with a dip of 960° to 970°; (95) a still larger fold with a dip of 970° to 980°; (96) a still larger fold with a dip of 980° to 990°; (97) a still larger fold with a dip of 990° to 1000°; (98) a still larger fold with a dip of 1000° to 1010°; (99) a still larger fold with a dip of 1010° to 1020°; (100) a still larger fold with a dip of 1020° to 1030°; (101) a still larger fold with a dip of 1030° to 1040°; (102) a still larger fold with a dip of 1040° to 1050°; (103) a still larger fold with a dip of 1050° to 1060°; (104) a still larger fold with a dip of 1060° to 1070°; (105) a still larger fold with a dip of 1070° to 1080°; (106) a still larger fold with a dip of 1080° to 1090°; (107) a still larger fold with a dip of 1090° to 1100°; (108) a still larger fold with a dip of 1100° to 1110°; (109) a still larger fold with a dip of 1110° to 1120°; (110) a still larger fold with a dip of 1120° to 1130°; (111) a still larger fold with a dip of 1130° to 1140°; (112) a still larger fold with a dip of 1140° to 1150°; (113) a still larger fold with a dip of 1150° to 1160°; (114) a still larger fold with a dip of 1160° to 1170°; (115) a still larger fold with a dip of 1170° to 1180°; (116) a still larger fold with a dip of 1180° to 1190°; (117) a still larger fold with a dip of 1190° to 1200°; (118) a still larger fold with a dip of 1200° to 1210°; (119) a still larger fold with a dip of 1210° to 1220°; (120) a still larger fold with a dip of 1220° to 1230°; (121) a still larger fold with a dip of 1230° to 1240°; (122) a still larger fold with a dip of 1240° to 1250°; (123) a still larger fold with a dip of 1250° to 1260°; (124) a still larger fold with a dip of 1260° to 1270°; (125) a still larger fold with a dip of 1270° to 1280°; (126) a still larger fold with a dip of 1280° to 1290°; (127) a still larger fold with a dip of 1290° to 1300°; (128) a still larger fold with a dip of 1300° to 1310°; (129) a still larger fold with a dip of 1310° to 1320°; (130) a still larger fold with a dip of 1320° to 1330°; (131) a still larger fold with a dip of 1330° to 1340°; 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(294) a still larger fold with a dip of 2960° to 2970°; (295) a still larger fold with a dip of 2970° to 2980°; (296) a still larger fold with a dip of 2980° to 2990°; (297) a still larger fold with a dip of 2990° to 3000°; (298) a still larger fold with a dip of 3000° to 3010°; (299) a still larger fold with a dip of 3010° to 3020°; (300) a still larger fold with a dip of 3020° to 3030°; (301) a still larger fold with a dip of 3030° to 3040°; (302) a still larger fold with a dip of 3040° to 3050°; (303) a still larger fold with a dip of 3050° to 3060°; (304) a still larger fold with a dip of 3060° to 3070°; (305) a still larger fold with a dip of 3070° to 3080°; (306) a still larger fold with a dip of 3080° to 3090°; (307) a still larger fold with a dip of 3090° to 3100°; (308) a still larger fold with a dip of 3100° to 3110°; (309) a still larger fold with a dip of 3110° to 3120°; (310) a still larger fold with a dip of 3120° to 3130°; (311) a still larger fold with a dip of 3130° to 3140°; (312) a still larger fold with a dip of 3140° to 3150°; (313) a still larger fold with a dip of 3150° to 3160°; (314) a still larger fold with a dip of 3160° to 3170°; (315) a still larger fold with a dip of 3170° to 3180°; (316) a still larger fold with a dip of 3180° to 3190°; (317) a still larger fold with a dip of 3190° to 3200°; (318) a still larger fold with a dip of 3200° to 3210°; (319) a still larger fold with a dip of 3210° to 3220°; (320) a still larger fold with a dip of 3220° to 3230°; (321) a still larger fold with a dip of 3230° to 3240°; (322) a still larger fold with a dip of 3240° to 3250°; (323) a still larger fold with a dip of 3250° to 3260°; (324) a still larger fold with a dip of 3260° to 3270°; (325) a still larger fold with a dip of 3270° to 3280°; (326) a still larger fold with a dip of 3280° to 3290°; (327) a still larger fold with a dip of 3290° to 3300°; (328) a still larger fold with a dip of 3300° to 3310°; (329) a still larger fold with a dip of 3310° to 3320°; (330) a still larger fold with a dip of 3320° to 3330°; (331) a still larger fold with a dip of 3330° to 3340°; (332) a still larger fold with a dip of 3340° to 3350°; (333) a still larger fold with a dip of 3350° to 3360°; (334) a still larger fold with a dip of 3360° to 3370°; (335) a still larger fold with a dip of 3370° to 3380°; (336) a still larger fold with a dip of 3380° to 3390°; (337) a still larger fold with a dip of 3390° to 3400°; (338) a still larger fold with a dip of 3400° to 3410°; (339) a still larger fold with a dip of 3410° to 3420°; (340) a still larger fold with a dip of 3420° to 3430°; (341) a still larger fold with a dip of 3430° to 3440°; (342) a still larger fold with a dip of 3440° to 3450°; (343) a still larger fold with a dip of 3450° to 3460°; (344) a still larger fold with a dip of 3460° to 3470°; (345) a still larger fold with a dip of 3470° to 3480°; (346) a still larger fold with a dip of 3480° to 3490°; (347) a still larger fold with a dip of 3490° to 3500°; (348) a still larger fold with a dip of 3500° to 3510°; (349) a still larger fold with a dip of 3510° to 3520°; (350) a still larger fold with a dip of 3520° to 3530°; (351) a still larger fold with a dip of 3530° to 3540°; (352) a still larger fold with a dip of 3540° to 3550°; (353) a still larger fold with a dip of 3550° to 3560°; (354) a still larger fold with a dip of 3560° to 3570°; (355) a still larger fold with a dip of 3570° to 3580°; (356) a still larger fold with a dip of 3580° to 3590°; (357) a still larger fold with a dip of 3590° to 3600°; (358) a still larger fold with a dip of 3600° to 3610°; (359) a still larger fold with a dip of 3610° to 3620°; (360) a still larger fold with a dip of 3620° to 3630°; (361) a still larger fold with a dip of 3630° to 3640°; (362) a still larger fold with a dip of 3640° to 3650°; (363) a still larger fold with a dip of 3650° to 3660°; (364) a still larger fold with a dip of 3660° to 3670°; (365) a still larger fold with a dip of 3670° to 3680°; (366) a still larger fold with a dip of 3680° to 3690°; (367) a still larger fold with a dip of 3690° to 3700°; (368) a still larger fold with a dip of 3700° to 3710°; (369) a still larger fold with a dip of 3710° to 3720°; (370) a still larger fold with a dip of 3720° to 3730°; (371) a still larger fold with a dip of 3730° to 3740°; (372) a still larger fold with a dip of 3740° to 3750°; (373) a still larger fold with a dip of 3750° to 3760°; (374) a still larger fold with a dip of 3760° to 3770°; (375) a still larger fold with a dip of 3770° to 3780°; (376) a still larger fold with a dip of 3780° to 3790°; (377) a still larger fold with a dip of 3790° to 3800°; (378) a still larger fold with a dip of 3800° to 3810°; (379) a still larger fold with a dip of 3810° to 3820°; (380) a still larger fold with a dip of 3820° to 3830°; (381) a still larger fold with a dip of 3830° to 3840°