MAP SHOWING GEOLOGY AND GEOCHEMICALLY FAVORABLE AREAS IN THE CRAIG AND DIXON ENTRANCE QUADRANGLES AND THE WESTERN EDGES OF THE KETCHIKAN AND PRINCE RUPERT QUADRANGLES, SOUTHEAST ALASKA

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EXPLANATION

29 **Favorable geochemically anomalous area**—Referred to by number in text table 7. See text table 7 for summary of known occurrences, anomalous elements, and mineral deposit types expected in the area

GEOCHEMICAL SAMPLE SITES

- ○1 **Alaska Mineral Resource Assessment Program (AMRAP) sediment sample site**
- ○2 **AMRAP anomalous sample site**—Number refers to site listed by geochemically anomalous area in text table 7
- ●3 **Anomalous sediment sample site other than AMRAP**—Number refers to site listed by geochemically anomalous area in text table 7
- ×4 **Anomalous rock sample site**—Number refers to site listed by geochemically anomalous area in text table 7

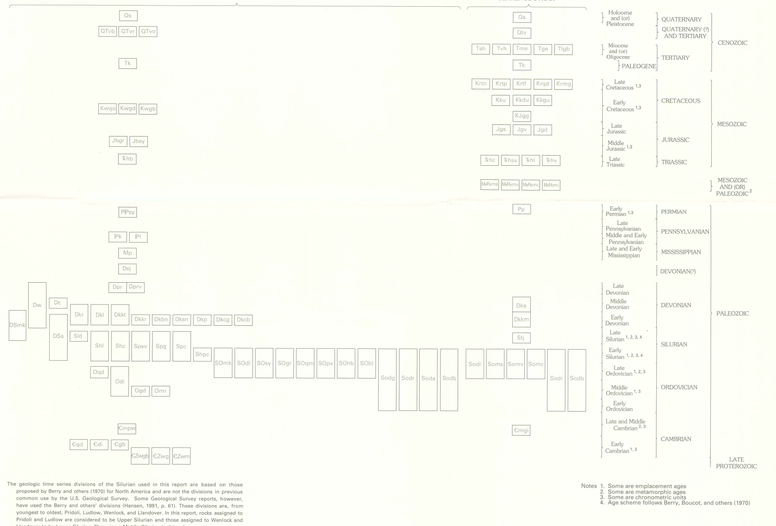
KNOWN OCCURRENCES

[Letter refers to mine, prospect, or occurrence listed by geochemically anomalous area in text table 7]

- ■A **Mine**—Mineral deposit that has recorded production. In some cases, ore may have been mined but not shipped. May or may not be active
- ▲B **Prospect**—Deposit that has been staked and, in most cases, has been scantily explored but lacks evidence of production. Probably some of the gold deposits that are listed as prospects have had at least meager production, but, because of lack of substantive evidence, they are classified as prospects. May or may not be active
- ♦C **Occurrence**—Deposit that may or may not be claimed and is mainly known from published early reports, from recent U.S. Geological Survey, Alaska Division of Geological and Geophysical Surveys, or U.S. Bureau of Mines investigations, or from reliable but otherwise unconfirmed reports released by private mining interests

CORRELATION OF MAP UNITS

(SEE DESCRIPTION OF MAP UNITS FOR SPECIFIC UNIT AGE ASSIGNMENTS)



The geologic time series divisions of the Silurian used in this report are based on those proposed by Berry and others (1970) for North America and are not the divisions in previous common use by the U.S. Geological Survey. Some Geological Survey reports, however, have used the Berry and others' divisions (Hansen, 1991, p. 61). These divisions are, from youngest to oldest, Pridoli, Ludlow, Wenlock, and Llandover. In this report, rocks assigned to Pridoli and Ludlow are considered to be Upper Silurian and those assigned to Wenlock and Llandover to be Lower Silurian. There is no Middle Silurian in this scheme.

Notes 1. Some are emplacement ages
2. Some are metamorphic ages
3. Some are chronostratic units
4. Age scheme follows Berry, Boucot, and others (1970)

BRIEF DESCRIPTION OF MAP UNITS

UNITS EXPOSED SOUTHWEST OF CLARENCE STRAIT

Qs **Surficial deposits (Holocene and (or) Pleistocene)**—Alluvium, colluvium, tidal mudflat deposits, and some possible glaciofluvial deposits

QTvb **Extrusive volcanic rocks (Quaternary? and Tertiary)**—As mapped, divided into:

QTvr **Basaltic to rhyolitic breccia and tuff**

QTvs **Rhyolite and dacite**

Tk **Olivine basalt and andesite**

Kwqo **Kootznahoo Formation (Paleogene)**—Sandstone, conglomeratic sandstone, and conglomerate

Kwgd **Intrusive rocks of the Chuck-Prince of Wales plutonic province (Early Cretaceous)**—As mapped, divided into:

Kwgb **Hornblende quartz monzodiorite and minor tonalite, granodiorite, quartz diorite, diorite, quartz monzonite, and monzodiorite**

Jbgr **Hornblende granodiorite, hornblende diorite, and biotite-hornblende monzodiorite**

Jbsy **Gabbro**

Trkb **Intrusive rocks of the Bokan Mountain plutonic province (Middle Jurassic)**—As mapped, divided into:

PPsy **Peralkaline granite of Bokan Mountain**

IPk **Syenite of Dora Bay**

IPl **Oligomictic breccia of the Hyd(?) Group (Late Triassic?)**

Mp **Leucosyenite of Klawock and Sukkwan Island (Early Permian and Late Pennsylvanian)**—Biotite- and hornblende-bearing syenite

Dsj **Klawak Formation (Middle and Early Pennsylvanian)**—Sandstone, siltstone, and minor limestone and chert-pebble conglomerate

Dpr **Ladrones Limestone (Middle and Early Pennsylvanian)**—Massive and sublithographic limestone and minor dolomite

Dprv **Peratrovich Formation (Late and Early Mississippian)**—Limestone containing dark-gray chert nodules and beds that grades downward to bedded chert

Dw **St. Joseph Island Volcanics (Devonian?)**—Massive, locally amygdaloidal and pillowed, basalt flows

Dc **Port Refugio Formation (Late Devonian; Famennian)**—Massive to thick- and thin-bedded volcanic-detritus-rich graywacke, mudstone, siltstone, and minor polymictic conglomerate, black pyritic siltstone, calcareous siltstone, pillow basalt, tuff, fossiliferous limestone, and quartzofeldspathic arenite. Locally includes:

Dkr **Volcanic rocks**—Agglomerate, pillow basalt, and aquagene tuff

Dkl **Wadleigh Limestone (Late to Early Devonian; Famennian to Emsian)**—Massive and thick- to medium-bedded limestone, minor argillaceous limestone and calcareous shale

Dkkt **Coronados Volcanics (Middle Devonian)**—Fragmental basalt sandstone, dated with fossiliferous limestone and amygdaloidal pillows

Dkkr **Karheen Formation and associated rocks (Middle? and Early Devonian)**—As mapped, divided into:

Dkbm **Rhyolite of Kasaan Island (Middle? and Early Devonian)**

Dksn **Limestone of Kasaan Island (Middle? and Early Devonian)**

Dkp **Turbidite-facies rocks (Middle? and Early Devonian)**—Mudstone, siltstone, shale, sandstone, conglomerate, and minor limestone

Dkcg **Redbed-facies rocks (Early Devonian)**—Sandstone, shale, conglomerate, and minor well-bedded platy limestone

Dkcp **Breccia of northeastern Noyes Island (Early Devonian)**—Olistostromal blocks and breccia beds of limestone rich in shelly fossils and conodonts in matrix of graptolite- and plant-bearing shale

DSmk **Sedimentary rocks of the Port Nicholas area (Early Devonian)**—Sandstone overlain by limestone and graptolitic shale

DSs **Plagioclase-porphyritic dacite(?), andesite, and diorite(?) (Early Devonian)**—Small plugs and associated(?) flows, breccias, and dikes

Sld **Conglomerate-facies rocks (Early Devonian)**—Polymictic conglomerate, conglomeratic sandstone, sandstone, siltstone, and volcanic rocks

Shl **Siltstone, sandstone, polymictic conglomerate, and limestone of Clover Bay (Early? Devonian)**—Calcareous well-bedded sandstone, siltstone and subordinate gray argillaceous limestone and mudstone

Shc **Metamorphic rocks at Kliskas Inlet (Early Devonian and Silurian)**—Semischist, greenstone, and leucodiorite

Spsv **Sedimentary rocks of the Stoney Creek and Tuxekan Passage area (Early Devonian? and Late and Early Silurian)**—Limestone, sandstone, mudstone, and polymictic conglomerate

Spg **Leucodiorite at Kasa Inlet (Late Silurian)**—Medium- to coarse-grained melanite(?)-sphene-arfvedsonite leucodiorite

Spc **Heceta Limestone (Late and Early Silurian)**—As mapped, divided into:

Shpc **Limestone, minor limestone breccia, sandstone, mudstone, and polymictic conglomerate**

Ogd **Polymictic conglomerate**

Ogdl **Bay of Pillars Formation (Late and Late? and Early Silurian)**—As mapped, divided into:

Ogvr **Sedimentary and volcanic rocks**—Graywacke, mudstone turbidites, polymictic conglomerate, minor limestone, and andesitic to basaltic volcanic flows, breccia, and tuff

Spg **Volcaniclastic graywacke, mudstone turbidites, and minor limestone**

Spc **Conglomerate, agglomerate, and volcanic breccia**

Shpc **Polymictic conglomerate between Heceta Limestone and Bay of Pillars Formation (Early? Silurian)**—Polymictic pebble and cobble conglomerate and other clastic rocks

Intrusive and related rocks of the younger part of the Cape Chacon plutonic province (Early Silurian and Late Ordovician)—As mapped, divided into:

SOmk **Metamorphic rocks at Kendrick Bay**

SOdi **Diorite, quartz diorite, gabbro, hornblendite, leucogabbro, trondhjemite, pyroxenite, and migmatite**

SOsy **Quartz syenite and granite**

SOgr **Granite**

SOqm **Unfoliated and foliated quartz monzonite and granite**

SOpx **Pyroxenite, hornblendite, and gabbro**

SOhb **Hornblendite**

SObl **Andesitic breccia of Luck Creek (Early Silurian and Late Ordovician)**—Angular fragments of porphyritic andesite in a matrix of hornblende-diopsidic augite crystal tuff of andesitic composition

Descon Formation (Early Silurian to Early Ordovician)—As mapped, divided into:

SOdg **Volcaniclastic graywacke, siltstone, mudstone turbidites, and minor sedimentary breccia, limestone, and polymictic conglomerate**

SOdr **Dacitic to rhyolitic volcanic rocks**

SOda **Andesitic to dacitic volcanic rocks**

SOdb **Basaltic to andesitic volcanic rocks**

Intrusive and related rocks of the older part of the Cape Chacon plutonic province (Late and Middle Ordovician)—As mapped, divided into:

Oqd **Hornblende quartz diorite, diorite, and quartz monzonite (Late Ordovician)**

Odi **Foliated and layered hornblende diorite and quartz diorite, heterogeneous diorite and gabbro, and minor foliated granodiorite (Late and Middle? Ordovician)**

Ogd **Foliated hornblende granodiorite, chlorite leucogranodiorite, and quartz-porphyritic granodiorite (Middle Ordovician)**

Omr **Metamorphic rocks at Ruth Bay (Middle Ordovician)**

Cmpw **Metamorphic rocks on eastern Prince of Wales Island (Late and Middle Cambrian)**—Foliated, slightly layered, metamorphosed diorite, microdiorite, quartz diorite, gabbro, microgabbro, and hornblendite

Intrusive rocks of the southern Dall Island plutonic province (Early Cambrian)—As mapped, divided into:

Cgd **Foliated, lineated, and gneissic biotite-hornblende quartz diorite, granodiorite, and minor diorite**

C-dl **Foliated and layered biotite-hornblende diorite and quartz diorite**

C-gb **Hornblende gabbro, microgabbro, and quartz diorite**

CZwgb **Wales Group (Early Cambrian? and Late Proterozoic)**—As mapped, divided into:

CZwg **Metagabbro south of Kassa Inlet**

CZwm **Greenstone, greenschist, black phyllite, quartz-sericite schist, metakeratophyre, and minor marble**

CZwm **Marble and minor calc-silicate rocks**

UNITS EXPOSED NORTHEAST OF CLARENCE STRAIT

Qs **Surficial deposits (Holocene and (or) Pleistocene)**—Alluvium, colluvium, tidal mudflat deposits, and some glaciofluvial deposits

QTv **Extrusive volcanic rocks (Quaternary? and Tertiary)**—Basalt and andesite

Intrusive and related rocks of the Kutu-Etolin volcanic-plutonic province (Miocene and (or) Oligocene)—As mapped, divided into:

Tsh **Hornfelsed sedimentary rocks**

Tvh **Hornfelsed volcanic rocks**

Tme **Migmatitic granitic rocks of southern Etolin Island**

Tge **Granitic rocks of southern Etolin Island**

Tigh **Leucogabbro near Ketchikan**

Tk **Kootznahoo Formation (Paleogene)**—Conglomerate, sandstone, siltstone, shale, and minor lignite

Intrusive and related rocks of the Admiralty-Revillagigedo plutonic province (Late Cretaceous)—As mapped, divided into:

Krtn **Nonfoliated plagioclase-porphyritic (hornblende-) (epidote-) garnet-biotite tonalite, quartz diorite, and minor granodiorite**

Krtp **Porphyritic, foliated biotite tonalite, quartz diorite, and granodiorite**

Krtf **Foliated to massive hornblende-biotite tonalite and granodiorite, quartz monzonite, and quartz diorite**

Krgd **Quartz diorite**

Krmg **Migmatite**

Intrusive rocks of the Klukwan-Duke plutonic province (Early Cretaceous)—As mapped, divided into:

Kku **Ultramafic rocks, mainly dunite, peridotite, clinopyroxenite, and hornblendite**

Kkdu **Dunite, pyroxenite, and peridotite at Union Bay**

Kkgu **Gabbro and diorite at Union Bay**

Sedimentary, volcanic, and related rocks of the Gravina belt—As mapped, divided into:

KJgg **Gravina Island Formation (Early Cretaceous and Late Jurassic)**—Sedimentary and minor volcanic rocks

Jgs **Sedimentary and minor volcanic rocks (Late and Middle Jurassic)**

Jgv **Andesitic to basaltic volcanic and volcaniclastic rocks and minor sedimentary rocks (Late and Middle Jurassic)**

Jgd **Altered dacite and quartz diorite (Late and Middle Jurassic)**

Trhc **Hyd Group (Late Triassic)**—As mapped, divided into:

Trhsv **Chapin Peak Formation**—Basaltic volcanic and minor sedimentary rocks

Trkl **Sedimentary and mafic volcanic rocks**

Trksv **Limestone and dolomite**

Felsic volcanic rocks

MsPmns **Metamorphosed sedimentary, volcanic, and intrusive rocks (Mesozoic and (or) Paleozoic)**—As mapped, divided into:

MsPmmv **Metasedimentary rocks**—Metamorphosed pelitic and semipelitic volcaniclastic rocks

MsPmmc **Metavolcanic rocks**—Metamorphosed marine andesitic and basaltic lava flows, agglomerate, and tuff, together with minor pelitic and semipelitic flysch

MsPmmi **Metaplutonic conglomerate**

Metaintrusive rocks

Pp **Pybus(?) Formation (Early Permian)**—Light-brown-weathering, massive to laminated, light-gray, dark-gray, and bluish-gray marble, together with minor phyllite, semischist, metaplutonic conglomerate or sedimentary breccia, and quartzite-or-felsic-volcanic-rock fragmental schist and semischist

Dka **Karheen Formation and associated rocks**—As mapped, divided into:

Dkkm **Andesitic flows and breccia (Middle? Devonian)**

Stj **Mudstone-and-siltstone-facies rocks (Middle(?) and Early Devonian)**

SOdi **Trondhjemite, diorite, and granite of Annette Island (Late Silurian)**—Medium- to coarse-grained, light-gray, generally leucocratic (chlorite-) (biotite-) (hornblende-) trondhjemite, quartz diorite, diorite, granite, quartz monzonite, and granodiorite

Intrusive rocks of the younger part of the Cape Chacon plutonic province (Early Silurian and Late Ordovician)—Diorite, quartz diorite, gabbro, hornblendite, leucogabbro, trondhjemite, pyroxenite, and migmatite

Metamorphosed rocks on the Cleveland Peninsula (Silurian and (or) Ordovician)—As mapped, divided into:

SOms **Metasedimentary rocks**—Metamorphosed mudstone, siltstone, sandstone, grit, conglomerate, and minor limestone

SOmv **Metavolcanic rocks**—Metamorphosed andesitic and basaltic metatuff and agglomerate and minor pelitic rocks and limestone

SOmc **Metacarbonate rocks**—Metamorphosed limestone; now fine-grained gray marble

Descon Formation (Early Silurian to Early Ordovician)—As mapped, divided into:

SOdr **Dacitic to rhyolitic volcanic rocks**

SOdb **Basaltic to andesitic volcanic rocks**

Cmgi **Metamorphic rocks on southern Gravina Island (Late and Middle Cambrian)**—Foliated, slightly layered, metamorphosed diorite, microdiorite, quartz diorite, gabbro, microgabbro, and hornblendite

Contact—Dotted where concealed

High-angle fault—Dotted where concealed

Low-angle or contractional fault—Saw teeth on upper plate; dotted where concealed

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