



Metallogeny of the Alaskan and Canadian Cordillera: Preface

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This Society of Economic Geologists compilation contains more than 300 papers on ore deposits of the Northern Cordillera, published from 1905 through 2013 in *Economic Geology*, the Anniversary Volumes, Economic Geology Monographs, Reviews in Economic Geology, Special Publications, SEG Guidebooks, and the *SEG Newsletter*.

The Cordillera of North America is host to a wide variety of deposit types and commodities. Some of the deposits are among the largest of their type in the world. Common deposit types include intrusion-related Au, porphyry Cu (Mo-Au), epithermal Au-Ag, volcanogenic massive sulfide (Pb-Zn-Cu \pm Ag), sediment-hosted stratiform base metal (Mississippi Valley-type, Sedex Pb-Zn \pm Ag, and sedimentary Cu), orogenic Au, skarn, and magmatic Ni-Cu-PGE deposits. The Northern Cordillera is also well known for world-famous placer gold deposits in the Klondike and Fairbanks districts. Relatively rare deposits such as Kennecott-type Cu, Sn- and W-bearing granite, REE-enriched, and epizonal Hg, Sb, and Au deposits occur locally.

The compilation is subdivided into 15 sections reflecting 14 specific subtypes of ore deposits, with one section on regional metallogeny.

The section on epithermal Au-Ag deposits includes papers that are restricted to British Columbia and Yukon (Clapp, 1915; Dolmage, 1918, Campbell, 1959; Cyr et al., 1984; Wojdak and Sinclair, 1984; Diakow et al., 1991; and Love et al., 1998), as are those in the section on polymetallic veins (Boyle et al., 1970; Templeman-Kluit, 1970; Beaudoin and Sangster, 1992; Robinson and Godwin, 1995; Sack and Lichtner, 2009). In contrast, papers in the section on epizonal Hg, Sb, and Au deposits are restricted to Alaska (Cady et al., 1944; Gray et al., 1997; Goldfarb et al., 2004). Whereas most Kennecott Cu deposits are in Alaska (Knopf, 1910; Bateman and McLaughlin, 1920; Murray-Hughes, 1921; Lasky, 1930; Bateman, 1932; Bastin, 1933; Forbes and Barsdate, 1969; MacKevett, 1997), a few papers in the section describe native copper occurrences on Vancouver Island, BC (Surdam, 1968; Lincoln, 1981). Papers in the section on intrusion-related gold deposits in Yukon and Alaska are all relatively recent (Mair et al., 2006, 2011; Baker, 2002; Baker et al., 2006; McCoy et al., 1997; Lang et al., 2000; Hart et al., 2002, 2004; Pontius et al., 2010; Campbell, 2006; Susina et al., 2012).

The placer deposits section includes papers on placer gold in the Klondike (Tyrrell, 1907; Knight et al., 1999a, b; Chapman et al., 2010a, b), Fairbanks district (Smith, 1913; Knopf, 1913; Hollister, 1991), and other placer gold deposits in Alaska (Desborough, 1970) and British Columbia (Tyrrell, 1919; Uglov and Johnston, 1923). Two papers on placer tin deposits are also included (Thompson, 1945; Stanley, 1961).

Alaska magmatic sulfide ores (Buddington, 1924; Foley et al., 1997) and, specifically, those in southeastern Alaska (Kerr, 1924; Walton and Kennedy, 1945; Czamanske et al., 1981; Thakurta et al.,

2006; Watkinson and Melling, 1992) and southwestern British Columbia (Aho, 1956; St. Louis et al., 1986) are the topic of another section.

Two sections include papers about uncommon (in the Cordilleran region) but important deposit types that include coal (Dillis and Hill, 1984; Van der Flier-Keller, 1991; Nixon, 1992; Cook and Fletcher, 1992), diamonds and emeralds (Camsell, 1911; Galbraith et al., 2009), asbestos and chrysotile (Gabrielse, 1960; Wilson et al., 2009), uranium (\pm thorium) and REE (Steevson, 1951; Staatz, 1978; Dickinson et al., 1987; Thompson, 1997), granite-related tin deposits (Puchner, 1986; Sainsbury, 1987; Puchner, 1987; Reed et al., 1989; Hudson et al., 1997), carbonatites (Millong and Groat, 2013), Carlin-type deposits (Arehart et al., 2013), and iron formations (Klein and Beukes, 1993).

The regional metallogeny section includes overview papers on ore deposits, magmatism, and tectonics of Alaska or broad regions within the state (Jewell, 1927; Smith, 1930; Reed, 1938; Einaudi and Hitzman, 1986; Goldfarb, 1997; Taylor et al., 2008; Graham et al., 2013) as well as in British Columbia (Kerr, 1937, 1938; Woodsworth, 1971; Griffiths and Sharp, 1984; Bordet and Hart, 2010) and Yukon (Nelson et al., 2013; Allan et al., 2013). Other papers focus on isotopic constraints on the genesis of different types of deposits (Kuo and Folinsbee, 1974; Godwin et al., 1982).

Most papers in this compilation are in the areas of porphyry, VMS, sedimentary rock-hosted base metal, skarn, and orogenic Au deposits and are listed below by province or state.

British Columbia

Porphyry/magmatic vein deposits

Endako: Dawson and Sinclair, 1974; Bloom, 1981; Selby et al., 2000; Villeneuve et al., 2001; Selby and Creaser, 2001

Quesnel terrane: Bailey and Hodgson, 1979; Vaca et al., 2010; LeFort et al., 2011;

Red Cris: Norris et al., 2010

Highland Valley: Olade and Fletcher, 1975, 1976; Fleet et al., 1997; Alva Jimenez et al., 2012

Metallogenic regions: Chile et al., 1998

Red Rose: Stevenson, 1947

Hudson Bay Mountain: Kerr, 1937

Boss Mountain: Soregaroli, 1975

Granisle and Bell: Wilson et al., 1980; Quan et al., 1987

Island: Arancibia and Clark, 1996

Kitsault: Steininger, 1985

Berg: Heberlein and Godwin, 1984

Babine: Zaluski et al., 1994

VMS deposits

Eskay Creek: Childe, 19996; Roth et al., 1999; Sherlock et al., 1999; Meuzelaar et al., 2010

Britannia district: Schofield, 1926; Payne et al., 1980; Waterman, 1982; Stone and Payne, 1982

Windy Craggy: Peter and Scott, 1999

Vancouver Island: Dolmage, 1916; Lincoln, 1981; Robinson et al., 1996; Godwin et al., 1996; Jones et al., 2005, 2006

Chu Chua: Aggarwal and Nesbitt, 1984

George: Smitheringale, 1928

Seneca: Armburst and Gannicott, 1980

Sedimentary rock-hosted base metal deposits

Gataga: Paradis et al., 1998

Sustut: Wilton and Sinclair, 1988

Regional BC/Yukon: Godwin, 1982; Godwin and Sinclair, 1982; Nelson et al., 2002; Paradis and Goodfellow, 2012

Orogenic gold deposits

Cariboo: Skerl, 1948;

Bridge River: McCann, 1922; Leitch et al., 1989

Premier: Burton, 1926

Bralorne-Pioneer: Leitch et al., 1991

Erickson: Sketchley and Sinclair, 1991; Mastalerz et al., 1995

Regional: Dunn and Ray, 1995; Jia et al., 2003; Nesbitt and Muehlenbachs, 1989

Skarn deposits

Marble Bay: Dolmage, 1921

Vancouver Island: Uglow, 1926; Stevenson and Jeffrey, 1964; Eastwood, 1965;

Craigmont: Christmas et al., 1969; Schau, 1970; Folinsbee, 1970

McDame: Cooke and Godwin, 1984

Nickel Plate: Ettliger, 1992

Mount Riordan: Ray et al., 1992

Phoenix: Sinclair and Percy, 1969

Atlin: Ray et al., 2000

Regional: Meinert, 1984; Ray et al., 1995

Yukon/Northwest Territories

Porphyry deposits

Minto: Pearson and Clark, 1979; Hood et al., 2010

Logtung: Noble et al., 1984

VMS deposits

Finlayson Lake: Piercey et al., 2001; Layton-Matthews et al., 2008; Bradshaw et al., 2008

Wolverine: Moll et al., 2006; Piercey et al., 2008

Metallogenic regions: Mortensen and Godwin, 1982

Sedimentary rock-hosted base metal deposits

Tom and Jason: Ansdell et al., 1989; Gardner and Hutcheon, 1985;

Anvil: Campbell and Ethier, 1974; Shanks et al., 1987

Selwyn basin: Fernandes et al., 2010

Redstone Copper: Chartrand and Brown, 1985

Regional BC/Yukon: Godwin, 1982; Godwin and Sinclair, 1982; Nelson et al., 2002; Paradis and Goodfellow, 2012; Nelson et al., 2013

Orogenic gold deposits

Klondike: Ash, 2006; Rushton et al., 1993

White Gold: Bailey et al., 2010

Skarn deposits

Cantung: Mathieson and Clark, 1984; Bowman, 1985

JC: Layne and Spooner, 1991; Layne et al., 1991

MacTung: Dick and Hodgson, 1982

Mike Lake: Mrozek and Newberry, 1997

Alaska

Porphyry deposits

Pebble: Kelley et al., 2010, 2013; Anderson et al., 2010, 2013; Lang and Gregory, 2013; Lang et al., 2013; Marsh, 2012; Eppinger et al., 2013; Harraden et al., 2013, Goldfarb et al., 2013, Ayuso et al., 2013; Gregory et al., 2013; Mathur et al., 2013

Southeast Alaska: Hudson et al., 1981

Mount Estelle: Crowe et al., 1991

Statewide: Young et al., 1997; Ashleman et al., 1997; Bundtzen and Miller, 1997

VMS deposits

Ambler district: Hitzman et al., 1986; Schmidt, 1986; Schmidt, 1988

Greens Creek area: Taylor et al., 2008; Fulton et al., 2004

Prince William Sound: Johnson, 1917; Bateman, 1924; Crowe et al., 1992; Sainsbury, 1993; Crowe et al., 1993

Bonnefield: Dusel-Bacon et al., 2012

Southeast Alaska: Lincoln, 1908; Barrie and Kyle, 1988

Johnson River: Steefel, 1987

Denali: Seraphim, 1975

Metallogenic regions: Newberry et al., 1986; Newberry et al., 1997; Lange et al., 1993

Sedimentary rock-hosted base metal deposits

Red Dog district: Harrover et al., 1982; Sterne et al., 1984; Lange et al., 1985; Moore et al., 1986; Young and Moore, 1987; Lange and Nokleberg, 1987; Koehler and Tikkanen, 1991; Kelley and Jennings, 2004; Young, 2004; Rombach and Layer, 2004; Werdon et al., 2004; Lewchuk et al., 2004; Dumoulin et al., 2004; Slack et al., 2004a, b; De Vera et al., 2004; Johnson et al., 2004; Leach et al., 2004; Kelley et al., 2004a, b, 2008; Ayuso et al., 2004; Morelli et al., 2004; Blevings et al., 2013

Ruby Creek: Runnels, 1969; Hitzman, 1986; Bernstein and Cox, 1986; Selby et al., 2009

Little White Man: Siron et al., 2010

Nimiuktuk: Barnes et al., 1982

Omar: Folger et al., 1986

Statewide: Schmidt, 1997a, b

Orogenic gold deposits

Pogo: Smith et al., 1999

Nome district/Rock Creek: Ford and Snee, 1996; Otto et al., 2009

Big Hurrah: Read and Meinert, 1986

Willow Creek: Madden-McGuire et al., 1989

Southeast (Chichagof, Juneau): Reed, 1939; Goldfarb et al., 1989; Goldfarb et al., 1991; Miller et al., 1995

Statewide: Goldfarb et al., 1997

Skarn deposits

Lost River: Sainsbury, 1960; Desborough and Sainsbury, 1970; Dobson, 1982

Ear Mountain: Swanson et al., 1988

Brooks Range region: Newberry et al., 1986

Statewide: Knopf, 1909; Newberry et al., 1997

Cordilleran-wide

A few papers cover topics that are general Cordilleran-wide regional discussions:

Porphyry deposits: Kirkham, 1971; Clark, 1972; Selby and Creaser, 2001; Davies, 1989

Sedimentary rock-hosted deposits: Young, 1995; Pratt and Warner, 2000; Maynard, 1995

Orogenic gold deposits: Nesbitt et al., 1989