Section 1 includes several of the landmark papers that helped to define and refine the porphyry copper model (e.g., Lowell and Guilbert, 1970; Sillitoe, 1972, 1973, 1989; Gustafson and Hunt, 1975; Henley and McNabb, 1978). Also included are recent syntheses of our current understanding of porphyry deposits (e.g., Sillitoe, 2000, 2010; Richards, 2003; Seedorff et al., 2005, Cooke et al., 2005; Williams-Jones and Heinrich, 2005). Section 1 does not contain all of the review papers published by SEG on porphyry deposits. Key review papers on specialized topics (e.g., breccias in porphyry environments; hydrological modeling; supergene mineralization; etc.) are provided in section 3 of the DVD.

Section 2 contains articles that describe the geology, alteration, mineralization, geochronology, and metallogeny of porphyry and related deposits from the world's major geographical regions. There is a strong bias to the Americas in this section of the compilation. This is because much of the early literature came from studies of porphyry deposits in the western United States, with several of the world's most comprehensively studied porphyry deposits located in this region (e.g., Bingham Canyon, Butte). South American porphyry deposits have also been studied intensively in more recent times. Several of the Society's Special Publications from the 1990s and 2000s were devoted mostly or entirely to studies of South American deposits. Not all of the focus has been on the Americas, however—porphyry deposits of Oceania and Asia have been documented in several special issues of *Economic Geology* since the 1970s. By comparison, porphyry deposits from Europe and Central America are poorly represented in the compendium. Table 1 provides details of the major porphyry deposits from each geographic region, based on metal endowment, that are documented on this DVD. Also listed are smaller deposits of particular significance to the development of the porphyry copper model.

Section 3 contains a series of papers on specialized topics from the porphyry literature. The subsection on porphyry Mo deposits contains papers that document their geology, alteration, mineralization, geochronology, and geochemistry, irrespective of geographical domain. This subsection also includes the key review papers on porphyry Mo deposits (e.g., White et al., 1981; Mutschler et al., 1981; Wallace, 1991. Because some porphyry Mo deposits contain significant W, the few papers that document Mo-W and W porphyry deposits are also provided in this subsection.

Breccias associated with porphyry copper deposits have been a source of fascination for many researchers. Early researchers wrestled with developing appropriate nomenclature for documenting and classifying breccias (e.g., Farmin, 1934; Bryner, 1961; Kents, 1964; Bryant, 1968). The seminal review paper of Sillitoe (1985) provided a clear genetic framework for the classification of hydrothermal breccias in porphyry-related environments that remains the most logical and internally consistent scheme available today. Landmark modeling papers by Burnham (1985) and McCullum (1985) are also included in this subsection, as they provide critical insights into the processes of fragmentation, transport and consolidation of breccia bodies. In recent times, breccia research has focused primarily on the origins of breccia-related mineralization in porphyry deposits (e.g., Landtwing et al., 2002, Ross et al., 2002, Frikken et al., 2005; Johnson and Thompson, 2006).

The geochemistry of mineralizing intrusions and magmatic suites that relate to porphyry-style mineralization was first documented in *Economic Geology* in the 1970s (e.g., Kesler et al., 1975, 1977; Mason, 1978; Hine and Mason, 1978). Classic studies have highlighted the association of porphyry mineralization with oxidized (magnetite series) magmas (e.g., Ishihara, 1981; Takagi and Tsukimura, 1997). After the landmark study of Baldwin and Pearce (1982), there has been growing interest from the exploration community for research into magmatic fertility indices as a way of assessing greenfields prospectivity, with several articles published in the last two decades that pertain to this topic (e.g., Lang and Titley, 1998; Kay et al., 1999; Hollings et al., 2011a, b). The recognition of adakite-like geochemical compositions of some porphyry-related intrusions has led to a recent surge in interest on this topic. Unfortunately, there are several ways to produce an adakite-like geochemical composition, creating some confusion amongst the scientific and exploration community as to the significance of adakitic geochemistry to porphyry mineralization. Recent articles by Richards and Kerrich (2007), Richards (2011) and Richards et al. (2012) provide clear explanations of the origins and significance of adakite-like geochemistry and how it relates to porphyry mineralization. Geochemical studies of igneous rocks have been influential on the development of geodynamic models for porphyry metallogenesis, and several review papers of geodynamic settings for porphyry provinces are included here (e.g., Kerrich et al., 2000; Yakubchuk et al., 2002; Hollings et al., 2005; Sillitoe, 2008; Mpodozis and Cornejo, 2012; Goldfarb et al., 2013).

Geochemical studies of altered rocks and alteration minerals from porphyry deposits have been undertaken for more than six decades, as researchers try to constrain the chemical conditions of porphyry-style alteration and mineralization. Much of the early research focused on biotite chemistry, where opportunities arose to compare igneous and hydrothermal biotites from individual deposits (e.g., Parry and Nackowski, 1963; Al-Hashimi and Brownlow, 1970; Parry, 1972; Moore and Czamanske, 1973; Jacobs and Parry, 1979; Munoz and Swenson, 1981). Later studies have investigated rutile (Czamanske et al., 1981) and clays (Parry et al., 2002; Franchini et al., 2007). The advent of laser ablation technology has allowed workers in recent times to evaluate trace element deportment in enargite (Deyell and Hedenquist, 2011) and pyrite (Gregory et al., 2013). Mass-balance considerations of the chemical changes associated with hydrothermal alteration have been evaluated through a number of whole-rock geochemical studies (e.g., Ford, 1978; Lanier et al., 1978; Moore, 1978; Scott, 1978; Anthony and Titley, 1994; Force, 1998).

Stable and radiogenic isotopic analyses have been used primarily to trace fluid and metal sources and to infer depositional processes in porphyry deposits. The classic sulfur isotope studies of the 1960s and 1970s provided insights into the predominantly magmatic source of sulfur (e.g., Field, 1966; Field and Moore, 1971; Lange and Cheney, 1971; Field and Gustafson, 1976). More recent studies elucidated the processes that control advanced argillic alteration and associated mineralization (e.g., Rye et al., 1992; Rye, 1993). Pioneering work on O-D isotopes created considerable debate regarding the relative importance of magmatic-hydrothermal and meteoric waters in porphyry systems (e.g., Sheppard et al., 1969, 1971; Taylor, 1974; Sheppard and Taylor, 1974; Sheppard and Gustafson, 1976). More recent work has identified a predominance of aqueous magmatic fluids (e.g., Watanabe and Hedenquist, 2001; Harris et al., 2005; Khashgerel et al., 2009; Cooke et al., 2011). Lead isotope studies generally show a mixture of crustal and mantle-derived Pb in porphyry deposits formed in geologically complex continental arc settings (e.g., Bouse et al., 1999; Tosdal et al., 1999; Titley, 2001; Chiaradia et al., 2004), but the effectiveness of this isotopic tracing technique in island-arc terrains can be limited by the lack of contrast between mantle-derived intrusions and volcanic wall rocks.

Pioneering petrographic and microthermometric studies of fluid inclusions from porphyry deposits were published in the 1970s, demonstrating that highly saline, high temperature brines are intimately associated with the core of porphyry deposits, and that these coexist with magmatic vapors (e.g., Roedder, 1970; Nash and Theodore, 1971; Moore and Nash, 1974; Chivas and Wilkins, 1977; Eastoe, 1978). With the advent of PIXE (e.g., Anderson et al., 1989) and laser ablation technology (e.g., Ulrich et al., 2001), recent studies have focused primarily on assessing the metal budgets of brines, vapors, and waters in porphyry environments, provided valuable new knowledge regarding metal transport that is informing new geochemical models of porphyry ore formation (Klemm et al., 2007; Rusk et al., 2008; Audétat et al., 2009; Pudack et al., 2009; Landtwing et al., 2010; Allan et al., 2011; Seo et al., 2012). Some recent studies have also documented melt inclusions from porphyry systems (Davidson and Kamenetsky, 2001; Davidson et al., 2005).

Thermodynamic and hydrological modeling can help researchers to understand hydrothermal phenomena in porphyry environments. Early researchers used chemical modeling to constrain fluid evolution during porphyry-related hydrothermal alteration and mineralization (e.g., Hemley and Jones, 1964; Fournier, 1967), and this approach continues to provide useful insights today (e.g., Hemley and Hunt, 1992; Fournier, 1999; Henley and Hughes, 2000; Inan, 2002; Einaudi et al., 2003). Hydrological models of convective heat transfer around cooling plutons have strongly influenced our understanding of the likely duration and spatial extent of hydrothermal activity in porphyry systems (e.g., Cathles, 1977; Norton, 1978; Cathles, 1981; Ingebritsen and Appold, 2012). Mass transfer modeling has helped to constrain the relative timing and effectiveness of metal portioning between magmas and hydrothermal fluids (e.g., Candela and Holland, 1986; Candela, 1989a, b).

Historically, many porphyry copper deposits in locations such as southwestern United States, northern Chile, and southern Peru were mined for their supergene resources. These near-surface, high-grade oxide resources were generally amenable to open pit mining at low stripping ratios, making them attractive mining targets. Much of the early porphyry literature in *Economic Geology*, which documents supergene aspects of porphyry deposits (e.g., White, 1924; Jarrell, 1944; Lovering, 1948; Schwartz, 1949) can therefore be found in this subsection of the DVD. Also provided are some of the classic early papers on mapping and appraising supergene mineralization and leached cappings (e.g., Morse and Locke, 1924; Blanchard and Boswell, 1925; Anderson, 1955), and the essential review of field techniques by Chavez (2000). A comprehensive review of supergene porphyry mineralization and alteration is provided by Sillitoe (2005). Also provided are several numerical modeling studies of supergene phenomena that were conducted in the 1980s (e.g., Brimhall et al., 1985; Ague and Brimhall, 1989; Alpers and Brimhall, 1989). In recent times, studies of supergene mineralization have undergone a renaissance through the application of nontraditional isotopic studies, such as copper (e.g., Melchiorre and Enders, 2003; Mathur et al., 2009, 2010; Braxton and Mathur, 2011; Mathur et al., 2013) and iodine (Reich et al., 2013).

The final subsection of the DVD contains papers on exploration methodologies, resource assessments, and case studies. Together with field mapping and core logging, geochemical and geophysical exploration are essential tools for porphyry deposit discovery. Early literature in *Economic Geology* documents pioneering attempts to use and develop geochemical and geophysical techniques to discover porphyry and related mineralization styles (e.g., Lovering et al., 1948, 1950; Almond and Morris, 1951; Clarke, 1953; Moxham et al., 1965; David and Guilbert, 1973; Abrams et al., 1983). New prospecting tools and methodologies have continued to be developed since the early days, and their applications are summarized in several papers here (e.g., Thompson et al., 1999; Chang et al., 2011; Berger et al., 2003). Lineaments have long been discussed as a potential targeting tool and fundamental geological control on porphyry deposit localization, with several articles reviewing the evidence for their existence and the implications for exploration (e.g., Wertz, 1970; Richards, 2000; Hildenbrand et al., 2000; Gow and Walshe, 2005). Useful summaries of successful exploration campaigns that provide insights into the appropriate technologies and management strategies that led to the discovery of several porphyry deposits are also provided (e.g., Lowell, 1991; Wood, 2012a, b). There are also reports on government-led initiatives that have attempted to quantify the undiscovered resources of prospective porphyry-mineralized belts (e.g., Geoffroy and Wignall, 1972; Singer et al., 2005; Cunningham et al., 2007).

Table 1. The Major Porphyry Copper Deposits from Each Geographical Region Documented on this DVD, Together with Smaller Deposits of Particular Historical and/or Scientific Interest

North America

- **Bingham Canyon, Utah** (Atwood, 1916; Farmin, 1933; Field, 1966; Moore et al., 1968; Bray, 1969; Moore and Lanphere, 1971; Field and Moore, 1971; Roedder, 1971; Moore and Czamanske, 1973; Moore and Nash, 1974; Einaudi et al., 1978; James, 1978; Lanier et al., 1978; Warnaars et al., 1978; Wilson, 1978; Reid, 1978; Atkinson and Einaudi, 1978; Parry et al., 1978; Moore, 1978; Lanier et al., 1978; Bowman et al., 1987; Deino and Keith, 1997; Philips et al., 1997; Ballantyne et al., 1997; Harrison and Reid, 1997; Chesley and Ruiz, 1997; Parry et al., 1997; Krahulec, 1997; Waite et al., 1997; Parry et al., 2001; Parry et al., 2002; Inan and Einaudi, 2002; Cunningham et al., 2004; Stavast et al., 2006; Austin and Ballantyne, 2010; Gruen et al., 2010; Krahulec, 2010; Landtwing et al., 2010; Loppenburg et al., 2010; Porter et al., 2010; Redmond and Einaudi, 2010; Seo et al., 2012; Porter et al., 2012; Steinberger et al., 2013)
- **Butte, Montana** (Simpson, 1908; Sales, 1910; Kirk, 1912; Rogers, 1913; Ray, 1914; Atwood, 1916; Agar, 1926; Sales and Meyer, 1949; Sales and Meyer, 1951; Murthy and Patterson, 1961a, b; Grunig et al., 1961; Garlick and Epstein, 1966; Raymahashay and Holland, 1969; Al-Hashimi and Brownlow, 1970; Lange and Cheney, 1971; Roedder, 1971; Sheppard and Taylor, 1974; Brimhall, 1977; Brimhall, 1979; Brimhall, 1980; Geissman et al., 1980; Woitsekhowskaya and Hemley, 1995; Rusk et al., 2008; Gammons et al., 2009)
- **Pebble, Alaska** (Kelley et al., 2010, 2013; Lang and Gregory, 2012; Anderson et al., 2013; Ayuso et al., 2013; Eppinger et al., 2013; Goldfarb et al., 2013; Gregory et al., 2013; Harraden et al., 2013; Lang et al., 2013; Mathur et al., 2013)
- **San Manuel-Kalamazoo, Arizona** (Lovering, 1948; Schwartz, 1949; Lovering et al., 1950; Lowell, 1968; Lowell and Guilbert, 1970; Lang-Farmer and Depaolo, 1987; Force et al., 1995)
- **Yerington, Nevada** (Harris and Einaudi, 1982; Carten, 1986; Dilles, 1987; Dilles et al., 1992; Dilles et al., 2000; Lipske and Dilles, 2000)
- **Climax, Colorado** (Roedder, 1971; Hall et al., 1974; Desborough and Sharp, 1978; White et al., 1980; Shannon et al., 2009)
- **Henderson, Colorado** (Wallace et al., 1978; Gunow et al., 1980; Carten et al., 1988; Seedorff and Einaudi, 2004a, b)

Central America

- **Cananea, Mexico** (Emmons, 1910; White, 1924; Warren, 1932; Kelley, 1935; Anderson and Silver, 1977; Meinert, 1982; Bushnell, 1988; Wodzicki, 2001)

South America

- **Rio Blanco – Los Bronces, Chile** (Warnaars et al., 1985; Serrano et al., 1996; Skewes and Stern, 1996; Kay et al., 1999; Vargas et al., 1999; Davidson and Kamanetsky, 2001; Davidson et al., 2005; Deckart et al., 2005; Frikken et al., 2005; Hollings et al., 2005; Irarrazaval et al., 2009; Toro et al., 2012)

- **El Teniente, Chile** (Lindgren and Bastin, 1922; Howell and Molloy, 1960; Camus, 1975; Clark et al., 1983; Skewes and Stern, 1996; Kay et al., 1999; Skewes et al., 2002; Maksaev et al., 2004; Cannell et al., 2005; Hollings et al., 2005; Cannell et al., 2007; Klemm et al., 2007; Skewes and Stern, 2007; Stern et al., 2007; Vry et al., 2010; Chiaradia et al., 2013)
- **Los Pelambres, Chile** (Sillitoe, 1973; Atkinson et al., 1996)
- **Chuquicamata, Chile** (Lopez, 1939; Jarrell, 1944; McInnes et al., 1999; Ossandon et al., 2001; Tomlinson et al., 2001; McInnes et al., 2001; Cuadra and Rojas, 2001; Brimhall et al., 2001; Arcuri et al., 2003; Campbell et al., 2006; Nelson et al., 2007; Rivera et al., 2009; Rivera et al., 2012; Reich et al., 2013)
- **La Escondida, Chile** (Alpers and Brimhall, 1989; Lowell, 1991; Petersen et al., 1996; Richards et al., 2001; Padilla-Garza et al., 2001, 2004; Herve et al., 2012)
- **Collahuasi, Chile** (Dick et al., 1994; Clark et al., 1998; Masterman et al., 2004, 2005; Nelson et al., 2007; Djouka-Fonkwe et al., 2012)
- **El Salvador, Chile** (Gustafson and Hunt, 1975; Field and Gustafson, 1976; Sheppard and Gustafson, 1976; Colley et al., 1989; Gustafson and Quiroga, 1995; Watanabe and Hedenquist, 2001; Mote et al., 2001a, b; Gustafson et al., 2001; Rivera et al., 2004; Bissig and Riquelme, 2009)
- **Bajo de la Alumbrera, Argentina** (Sillitoe, 1973; Sasso and Clark, 1998; Ulrich and Heinrich, 2001; Ulrich et al., 2001; Proffett, 2003; Harris et al., 2005, 2006)

Asia

- **Oyu Tolgoi, Mongolia** (Perelló et al., 2001; Khashgerel et al., 2006, 2009; Crane and Kavaleris, 2012)
- **Reko Diq, Pakistan** (Schmidt, 1968; Perelló et al., 2008; Richards et al., 2012)
- **Far South East - Lepanto, Philippines** (Hedenquist et al., 1998; Chang et al., 2011; Deyell and Hedenquist, 2011)

Oceania

- **Grasberg, Indonesia** (Rubin and Kyle, 1997; Pollard et al., 2005; Leys et al., 2012)
- **Panguna, Papua New Guinea** (Fountain, 1972; Page and McDougall, 1972; Baldwin et al., 1978; Ford, 1978; Eastoe, 1978, 1982, 1983; Eastoe and Eddington, 1986)
- **Ok Tedi, Papua New Guinea** (Bamford, 1972; Davies et al., 1978)
- **Cadia, Australia** (Wilson et al., 2003; Foster et al., 2004; Wilson et al., 2007; Wood, 2012a, b)