

ALPINE AND POLAR LITERATURE

1600

1729 Albrecht von Haller (Swiss naturalist and poet, 1708-1777) writes *Die Alpen (The Alps)*, a poem that celebrates mountain life and landscape.

1775 Jean Jacques Rousseau's (Swiss, 1712-1778) novel, *La Nouvelle Heloise (The New Eloise: Letters of Two Lovers, Inhabitants of a Small Town at the Foothills of the Alps)*, inspires a passion for alpine mountains and stimulates literary figures such as Lord George Byron (British, 1788-1824) and Mary and Percy Bysshe Shelley (British, 1792-1822) to experience Mont Blanc's glaciers.



1798 *Rime of the Ancient Mariner*, the epic poem by Samuel Taylor Coleridge (British, 1772-1834), which takes place in Antarctic waters, enjoys great popularity and is reprinted with illustrations by the artist Gustave Doré (French, 1832-1883) in the 1870s.

ALPINE EXPLORATION



1601 The first known close-up of a glacier, a topographical watercolor of the Rofener Glacier, is drawn by Abraham Jäger (Tiroler Landesmuseum, Innsbruck, Austria).

1670 The Hudson Bay Company becomes the de facto government for parts of North America and establishes trading posts along paths in the Rockies.

1700

1741 William Windham (British, 1717-1761) joins Richard Pococke (British anthropologist and clergyman, 1704-1765) on an expedition to Chamonix; they name the Mer de Glace glacier. His *An account of the glaciers or ice Alps in Savoy* (1744) becomes the first record of tourists to the region.



1786 Jacques Balmat (Sardinian mountaineer, 1762-1834) and Dr. Michel Paccard (Sardinian doctor, 1757-1827) are the first to reach the summit of Mount Blanc (15,782 ft, 4,810 m). Over the next hundred years, Mont Blanc becomes the most popular and best-documented mountain.

1793 Sir Alexander Mackenzie (Scottish explorer, 1764-1820), the first European to successfully cross the Rocky Mountains, begins his journey into the upper Fraser River and reaches Bella Coola, British Columbia.

POLAR EXPLORATION

1594-1610 Dutch and English explorers search for the Northwest and Northeast Passages to China for trade.

1596 William Barents (Dutch, 1550-1597), on his third attempt to find the Northeast Passage from Europe to Asia, discovers Spitsbergen (known today as Svalbard) and its rich whaling grounds.



ARCTIC

ARCTIC 1725-42 Russian Tsar Peter the Great sends Vitus Bering (Danish explorer, 1681-1741) to search for a Northeast Passage to North America. He maps the Arctic Coast of Siberia.

1770s During three voyages of discovery, Captain James Cook (British explorer, 1728-1779) crosses the Antarctic Circle (1773) and charts the coasts of Alaska and northeast Siberia (1778). For the first time, artists and naturalists join an expedition. William Hodges (British, 1714-1782) and Johann George Adam Forster (German, 1729-1798) create the first images of icebergs on the spot.



FUELING THE ECONOMY

1670 With close to 150 whaling ships, the Netherlands becomes one of the richest nations. This status changes with the depletion of whales in the North Atlantic and Arctic waters.

1712 Thomas Newcomen (British, 1664-1729) invents the first steam engine, which is used to pump water from coal mines. In 1769, James Watt (Scottish inventor, 1736-1819) improves the design for efficiency. Coal begins to replace other forms of energy—such as wood, wind, water, and whale oil—and propels the Industrial Revolution. Coal produces more carbon emissions than other fossil fuels.



1800

CLIMATE SCIENCE

1750 Joseph Black (Scottish chemist and physician, 1728-1799) identifies carbon dioxide (CO₂).

1781 Horace-Bénédict de Saussure (Swiss naturalist, 1740-1799) publishes *Voyages in the Alps*, the first extensive scientific study of the mountain chain. It is illustrated with realistic drawings of glaciers by artists such as Marc Theodore Bourrit (Swiss, 1739-1819), who was also a naturalist.

1770 CO₂ in atmosphere = 280 ppm

The concentration of CO₂ in the atmosphere is measured in parts per million (ppm). 1 ppm = 16.5 billion tons

1800

ALPINE AND POLAR LITERATURE



1816–17 Lord George Gordon Byron (British poet, 1788–1824) writes the epic poem *Manfred*, which takes place in the Alps.

1818 Mary Shelley (British, 1797–1851) stages parts of her gothic novel, *Frankenstein, Or the Modern Prometheus*, in the Alps and the Arctic.

1838 Inspired by Antarctic exploration, Edgar Allan Poe (American poet and writer, 1809–1849) publishes *The Narrative of Arthur Gordon Pym of Nantucket*.



1849 Francis Parkman (American historian, 1823–1893) publishes *The California and Oregon Trail*. Thomas Hart Benton (American artist, 1889–1975) illustrates a 1946 edition.

ALPINE EXPLORATION

1802 Joseph Mallard William Turner (British, 1775–1851) crosses the Alps for the first time to paint the snowcapped mountains and surrounding atmosphere. He returns to the Alps in the early 1840s.

1804–1806 The Lewis and Clark expedition, the first scientific reconnaissance of the Rocky Mountains, paves the way for travelers from the East.

1826–27 Sir Woodbine Parish (British scientist, 1796–1882) and Joseph Barclay Pentland (Irish geographer, 1797–1873) survey a large section of the Bolivian Andes in South America.

1833 John Ruskin (British, 1819–1900) makes the first of nineteen journeys to the Alps, which inspire scientific studies on glaciers and poems extolling their majesty. Takes the first photographs of the region in 1849 and paints watercolors inspired by JMW Turner, who he promotes as an artist.

1848 First Survey of Mount Everest, known then as "Peak B" or "Peak XV," in the Himalayas.

POLAR EXPLORATION

ARCTIC **1819–1820** Edward Parry (English, 1790–1855) discovers a section of the Northwest Passage and reaches Melville Island, farther west than any previous expedition. Frederick William Beechey (British, 1796–1856), a military officer and artist, documents the voyage, which inspires Caspar David Friedrich (German, 1774–1840) to paint *Sea of Ice* (1823–24).

ANTARCTICA **1839–1840** Three rival expeditions are launched: Admiral Jules Dumont d'Urville (French, 1790–1842) sights the Antarctic continent and names the area where he lands Terre Adélie; Lieutenant Charles Wilkes (American, 1798–1877) sails along fifteen hundred miles of previously undiscovered coast, named Wilkes Land; Sir James Clark Ross (English, 1800–1862) discovers the Ross Ice Shelf and the volcano Mount Erebus. The sketches of Louis Lebreton (French, 1818–1866) become lithographs for the atlas of the French voyage and are used for large-scale exhibition paintings.



ARCTIC **1836–1839** Commission scientifique du Nord, sponsored by the French government, explores Scandinavia and Spitsbergen. The artists Barthélemy Lauvergne (1805–1871), Charles Giraud (1819–1882), and Francois-August Biard (1799–1882) create drawings for the expedition atlas, exhibition paintings, and murals for the Museum of Natural History, Paris.



1845–47 John Franklin (British, 1786–1847) searches for the Northwest Passage and is never heard from again. From 1847 to 1859, Lady Jane Franklin persuades Laugland, the United States, and Russia to launch a total of fifty rescue voyages for her husband. In 1859, Franklin's death is confirmed.

FUELING THE ECONOMY

1821 First natural gas well is drilled in the United States, in Fredonia, New York.

1830 The first commercial coal-powered locomotive is inaugurated in the United States.

1830–1875 Rapid expansion of the Industrial Revolution with a corresponding rise in atmospheric carbon dioxide.

1849 Kerosene, distilled from oil by Abraham Gesner (Canadian geologist, 1797–1864), creates a new market for crude oil.

1850

CLIMATE SCIENCE

1800 CO₂ = 283 ppm

1824 Joseph Fourier (French physicist, 1768–1830) describes how Earth's atmosphere retains heat radiation, comparing it to a box with a glass lid. The phenomenon becomes known as the "greenhouse effect."



1840 Louis Agassiz (Swiss scientist, 1807–1873) introduces and popularizes the idea of an ice age. The artist Joseph Betannier (French, 1817–after 1877) illustrates Agassiz's influential book, *Studies on Glaciers*.

1842 Joseph Alphonse Adhémar (French mathematician, 1797–1862) publishes *Revolutions of the Sea*, arguing that ice ages result from variations in the ways the earth moves around the sun.

1850 CO₂ = 290 ppm

1850

ALPINE AND POLAR LITERATURE

1856–57 *The Frozen Deep: A Drama in Three Acts*, inspired by John Franklin's Northwest Passage expedition, is written by Wilkie Collins (British, 1824–1889) and staged by Charles Dickens (British, 1828–1905).

1866 Jules Verne's (French, 1828–1905) science fiction novel *The Voyages and Adventures of Captain Hatteras* follows the protagonist to the North Pole. It includes illustrations by Edouard Riou (French, 1883–1900).



1890 Mark Twain (American, 1835–1910) conveys his impressions of alpine glaciers in *A Tramp Abroad*, a travelogue that combines autobiographical and fictional events.

1897 Fridtjof Nansen (Norwegian, 1861–1930) publishes a diary of his three-year-long expedition to the North Pole, *Farthest North*. It recounts the hardships endured in an extreme climate coupled with his impressions of the magical Arctic landscape.

ALPINE EXPLORATION

1857 The Alpine Club in London, the first mountaineering organization, is established to promote better knowledge of the European Alps through literature, science, and art.

1860 Some of the first photographs of Mont Blanc are taken by Bisson Frères (Bisson brothers: Louis-Auguste Bisson and Auguste-Rosalie Bisson, French, 1814–1876 and 1826–1900). They document the expedition of Emperor Napoleon III and Empress Eugenie, who do not reach the summit.



1867–79 Clarence King (American geologist, 1842–1901) leads the Geological Exploration of the 40th Parallel and discovers Mount Shasta's Whitney Glacier, the first known glacier in the United States. The photographer Carleton Watkins (American, 1829–1916) accompanies the expedition and documents the glacier in 1870.

1889 Geographer Hans Meyer (German, 1858–1929) and mountaineer Ludwig Purtscheller (Austrian, 1849–1900) become the first to summit Mount Kilimanjaro (19,341 ft, 5,895 m) in Tanzania, Africa.

1892 John Muir (Scottish-American naturalist, 1838–1914) founds the Sierra Club, dedicated to environmental preservation. The artist Ansel Adams joins in 1919 and uses his photographs to lobby for conservation. The photographer Eliot Porter becomes its director in 1965 and serves to 1971.

1899 Mount Rainier National Park established.

POLAR EXPLORATION

ARCTIC



1860s The painter Frederic Edwin Church (American, 1826–1900) completes his tour de force, *The Icebergs* (1861), which tours New York, Boston, and London. In 1864, Edwin Landseer (British, 1802–1873) exhibits *Man Proposes, God Disposes* (1864), a social commentary on British polar exploration.



ARCTIC

1873 Publication of *Arctic Regions*, a landmark photographic account of the painter William Bradford's (American, 1823–1892) expedition off the coast of northwest Greenland in 1869. The voyage inspires the Arctic expeditions and photography of Rena Bass Forman (American, 1948–2011).

1882–83 First International Polar Year, an international collaboration of research and exploration, is launched.

ANTARCTICA

1895 Sixth International Geographical Congress passes a resolution urging exploration of Antarctica before the end of the nineteenth century. This spurs national expeditions.

ARCTIC

1893–96 Fridtjof Nansen and Otto Sverdrup (Norwegian, 1854–1930) drift across the Arctic Ocean in the *Fram*, which was built to withstand pressure from the ice. Establishes a new farthest point north reached by a nonnative explorer.

FUELING THE ECONOMY

1850s Peak of the American whaling industry, which fuels the economy and continental expansion. Five thousand sperm whales killed each year.

1859 Edwin Laurentine Drake (American, 1819–1880) drills the first commercial oil well in Titusville, Pennsylvania. This marks the beginning of the modern petroleum industry, which soon produces enough crude oil to displace whale oil for lighting.

1860 Invention of the first solar power system used to power a steam engine, by Augustin Mouchot (French, 1825–1912) in France.

1867 Nikolaus August Otto (German inventor, 1831–1891) patents the four-stroke internal combustion engine. Rapid mechanization of production spreads.



1882 Thomas Edison develops the first coal-fired electricity-generating station in New York City.

1888 Electricity is generated by a windmill for the first time, in Cleveland, Ohio.

CLIMATE SCIENCE

1859 John Tyndall (Irish physicist, 1820–1893) recognizes that naturally occurring gases, such as water vapor and carbon dioxide, trap heat and emit some of it back into space.

1870–1910 Second Industrial Revolution. Growth spurred by the expanded use of electricity, fertilizers and other chemicals, and improvements in public health.

1895 International Glacier Commission established and begins the first coordinated collection and publication of standardized information about glacier changes.

1896 Svante Arrhenius (Swedish, 1859–1927) publishes *On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground*, which suggests that atmospheric temperatures will rise 5.4° F (3° C) if the concentration of atmospheric carbon dioxide doubles.

1850 CO₂ = 290 ppm

1900 CO₂ = 295 ppm

1900

1900

ALPINE AND POLAR LITERATURE

1915 In *Travels in Alaska*, a compendium of nature essays, John Muir relates his experience with glaciers in the Pacific Northwest during trips in 1879, 1880, and 1890.

1922 An account by explorer Apsley Cherry-Garrard (British, 1886–1959) in *The Worst Journey in the World* describes Robert Falcon Scott's tragic expedition to the South Pole, but the "worst journey" is his own harrowing experience traveling in polar winter to a penguin rookery.



1933 *Lost Horizon*, a popular novel by James Hilton (British, 1900–1954), describes the utopian life of a Tibetan monastery isolated in the Himalayas.

1938 In *Alone*, Richard Byrd (American, 1888–1957) describes his life wintering in solitude, 125 miles south of his expedition base, in 1934.

ALPINE EXPLORATION

1902 American Alpine Club founded by a group of men and women, including Fannie Bullock Workman (1859–1925) and Annie Smith Peck (1850–1935), who is the first to summit Peru's Mt. Huascaran's north peak (21,830 ft, 6,653 m) in 1908.

1905 President Theodore Roosevelt (American, 1882–1945) creates Rocky Mountain National Park to preserve the wildlife within the mountain range.



1924 The artist Nicholas Roerich (Russian, 1874–1947) launches a four-year expedition through central Asia. The journey takes him to the Himalayas, which inspires his life's work. The painter Lawren Harris (Canadian, 1885–1970) makes his first trip to the Canadian Rockies and returns each year until 1927.



1947 Ansel Adams (American, 1902–1984) travels to Alaska and photographs Mount McKinley and Wonder Lake, Denali National Park.

POLAR EXPLORATION

ARCTIC

1909 Robert Peary (American, 1856–1920), Matthew Henson (African-American, 1866–1955), and four Inuit guides (Ooqueah, Ootah, Egingwah, Seegloo) reach the North Pole but do not bring back sufficient evidence to definitively prove it. The artist Isaac Julian (British, b. 1960), in his video *True North* (2004), resurrects Matthew Henson, the neglected explorer.

ANTARCTICA

1911–1912 Roald Amundsen (Norwegian, 1872–1928) reaches the South Pole. Robert Falcon Scott (British, 1868–1912) arrives one month later. Scott and four expedition members, including the physician and artist Edward Wilson (British, 1872–73), die on the return. In 1913, Scott's *Last Expedition* includes moving journal entries of the fatal journey to the South Pole and reproduces photographs by Herbert Ponting (British, 1870–1935) and watercolors by Edward Wilson.

ANTARCTICA

1914–16 Ernest Shackleton (Irish, 1874–1922) leads the Imperial Trans-Antarctic Expedition but is curtailed when his ship, the *Endurance*, is crushed by the ice. It results in the heroic rescue of all crew members. The photographer Frank Hurley (Australian, 1882–1962) creates iconic images of the expedition.

ANTARCTICA

1928–30 Admiral Richard Byrd (American, 1888–1957) establishes his base at Little America and flies to the South Pole in 1929. He returns to the continent in 1933–35 and is joined by the expedition's artist, David Abbey Paige (American, 1901–1979).



ANTARCTICA

1946–1947 Richard Byrd commands Operation Highjump with four thousand navy men who engage in aerial photography of the continent.

1950

FUELING THE ECONOMY

1903 Henry Ford (American industrialist, 1863–1947) establishes the Ford Motor Company and starts building automobiles. The Model T, introduced in 1908, marks the beginning of automobile mass production.



1920s Persian Gulf and Texas oil fields open, ushering in an era of "cheap oil."



1925 First modern whaling factory ships set sail from Norway. The industry grows, and approximately forty thousand whales are processed each year.

1938 US federal government regulates interstate natural gas sales with the Natural Gas Act (NGA) to protect against price gouging.

1946 International Whaling Commission, established by fifteen nations, is charged with the conservation of whales and the management of whaling, yet still in 1958, more than twenty thousand sperm whales are killed each year for margarine, cattle fodder, dog food, vitamin supplements, glue, leather preservative, and brake fluid.

CLIMATE SCIENCE

1900 CO₂ = 295 ppm

1928 Chlorofluorocarbons (CFCs), destructive atmospheric chemicals, are invented and used in refrigerators and air conditioners. After the discovery of a hole in the ozone by British scientists over the Antarctic in 1985 and mounting public outcry, CFCs are banned in 1987.

1930s Media reports of global warming motivates Guy Steward Callendar (British engineer, 1898–1964) to study data. He reports that temperatures increased between 1890–1935 and returns to an earlier idea that carbon dioxide emissions and increased temperatures are linked.

1932–33 Second International Polar Year for nations to coordinate their observations and analyses.

1941 After thirty years of research, Milutin Milankovitch (Serbian scientist, 1879–1958) attributes the cause of ice ages to changes in Earth's orbit over thousands of years

1950 CO₂ = 310 ppm

1950

ALPINE AND POLAR LITERATURE

1955 *The Last Kings of Thule: with the Polar Eskimos, as they face their destiny*, by Jean Malaurie (French, b. 1922), describes Inughuit culture in northern Greenland before and after the construction of an American air force base. Malaurie writes a foreword to *Inughuit* (2004). Tiina Ikonen's book of photographs on northern Greenland's people and environment.



1977 In *Coming into the Country*, John McPhee (American, b. 1931) presents a portrait of Alaska—people and landscape—from the wilderness to the city.

1986 Barry Lopez's (American, b. 1945) *Arctic Dreams: Imagination and Desire in a North Landscape*, a landmark study of the terrain, wildlife, and native people of the Far North, wins the National Book Award.

1988 In *The Arctic Grail: The Quest for the North West Passage and the North Pole, 1818-1909*, Pierre Bertin (Canadian, 1920-2004) brings to life the history of Arctic exploration.

ALPINE EXPLORATION

1953 Sir Edmund Hillary (New Zealand mountaineer and explorer, 1919-2008) and Tenzing Norgay (Nepali Sherpa mountaineer, 1915-1986) become the first men to summit Mount Everest.

1964-65 Thomas Hart Benton (American, 1889-1975) travels on horseback through Banff National Park in the Canadian Rockies.



1980s Widespread international interest in the geology of the Himalayas results in numerous expeditions, described by Mike Searle in *Colliding Continents: A Geological Exploration of the Himalaya, Karakoram, and Tibet* (2013)



1996 David Breashears (American mountaineer and filmmaker, b. 1955) co-directs the first IMAX documentary of Mount Everest, which premieres in 1998.

POLAR EXPLORATION

ARCTIC **1950-1986** Soviet Union establishes twenty-seven drifting research stations to explore the Arctic and study its climate.

1958 The US nuclear-powered submarine, *The Skate*, becomes the first vessel to surface at the North Pole.

1959 Antarctic Treaty signed by twelve countries (and since expanded to include fifty treaty member nations). It sets aside Antarctica as a scientific preserve, establishes freedom of scientific investigation, and bans military activity.

ANTARCTICA **1975** Eliot Porter is one of the first artists selected by the US National Science Foundation Antarctic Artists and Writers Program, established to expand awareness of polar research. It continues to expand the artistic legacy of polar landscapes. Australia, Great Britain, and New Zealand create similar programs in the 1970s.

ARCTIC **1970-78** Arctic Ice Dynamics Joint Experiment (AIDJEX) organized by the University of Washington Polar Science Center, "the first major western sea ice experiment constructed specifically to answer emerging questions about how sea ice moves and changes in response to the influence of ocean and atmosphere."

ANTARCTICA **1983** Scott Polar Research Institute in Cambridge produces the first glaciological atlas.

ANTARCTICA **1996** Ice core samples from the Russian Vostok base show 420,000 years of Earth's atmospheric history.

2000

FUELING THE ECONOMY

1950 Petroleum becomes the most popular fuel used in the United States as a result of the growing dependency on automobiles.

1957 The world's first commercial nuclear power plant opens in the United States, in Pennsylvania. Disasters at reactors in Chernobyl, Ukraine (1986) and the Fukushima Daibu Nuclear Power Plant in Japan (2011) stimulate nations to reconsider nuclear energy.

1960s Hydrogen fuel cells are developed by General Electric (GE) to generate electricity during US space missions.

1969 After the Santa Barbara oil spill, public outcry results in stricter regulations on leases and cleanup.

1973-74 After OPEC (Organization of Petroleum Exporting Countries) launches an oil embargo on the United States, consumers experience precipitous price increases. In 1977, US president Jimmy Carter encourages Americans to conserve energy and creates the Department of Energy and the Solar Energy Research Institute.

1986 Whaling moratorium takes effect. Meat and other whale products are effectively banned on the international commercial market. In 1994, a Southern Ocean Sanctuary is overwhelmingly adopted at the International Whaling Commission meeting.

1989 Exxon Valdez oil spill in Alaskan waters results in a massive loss of wildlife and habitat destruction. It remained the largest spill in the United States until a British Petroleum (BP) offshore oil rig explodes in the Gulf of Mexico in 2010.

1996-99 A solar operating plant in California, a joint project between the Department of Energy and US power utilities, demonstrates the potential to generate and store electricity efficiently.

1997 The electric car—EV1—makes its debut in California, but GM abandons the effort in 2002.

CLIMATE SCIENCE

1958 First direct measurement of atmospheric carbon dioxide concentrations on the summit of Mauna Loa, Hawaii (13,123 ft.) begins and continues to this day. Beginning of the Keeling Curve, a graph that shows atmospheric concentrations.

1965 Causes of Climate Change, the first major conference to address climate, meets in Boulder, Colorado, and fails to attract political or media attention.

1970-1980s Scientists raise concern about rising greenhouse gases and the role of the oceans as a carrier of heat and carbon dioxide. In 1979, the National Academy of Sciences issues its first major report on global warming.

1980s First attempt to compile a world glacier inventory by the World Glacier Monitoring Service and National Snow and Ice Data Center.

The hottest decade on record

1988 Intergovernmental Panel on Climate Change (IPCC) established by the United Nations Environmental Panel and the World Meteorological Organization. The IPCC compiles all significant research published in the world and produces synthesis reports in 1990, 1995, 2001, and 2007.

1990 Dr. Konrad Steffen (Swiss, b. 1952), a professor at the University of Colorado, Boulder, sets up Swiss Camp, a field site on the Greenland ice sheet, where he and colleagues monitor climate change. Between 1993 and 2008, temperature rises about 4° F (2.2°C). The artist Olaf Otto Becker (German, b. 1959) photographs the camp as well as the melting ice sheet in 2008.



1997 Kyoto Protocol, an international agreement linked to the United Nations Framework Convention on Climate Change, sets binding targets for industrialized countries for reducing greenhouse gas emissions. In 2001, President George W. Bush withdraws United States support for the agreement.

1958 CO₂ = 316 ppm

1979 CO₂ = 337 ppm

1992 CO₂ = 356 ppm

2000

ALPINE AND POLAR LITERATURE

2007 An anthology of classic writings on the Arctic and Antarctic, *The Ends of the Earth*, by Francis Spufford and Elizabeth Kolbert (American, b. 1964 and b. 1961) includes narratives, cultural histories, nature and science writing, and fiction.

2009 In *A World without Ice*, the geophysicist Henry Pollack (American, b. 1936) provides an accessible and comprehensive examination of the properties of ice, ice ages, and climate change.

2012 *Arctic Voices: Resistance at the Tipping Point*, edited by the photographer Subhankar Banerjee (American, b. India, 1967), includes writings of notable authors, naturalists, and activists, along with photographs that convey the importance of preserving the region amid the onslaught of industrial development.

ALPINE EXPLORATION

2009 *Nova* and *National Geographic* produce *Extreme Ice*, which documents James Balog's (American, b. 1952) time-lapse photography of retreating glaciers.



2010 *Northwest Mountaineering Journal* publishes an article on climate change and the dangerous impacts on climbing.

POLAR EXPLORATION

ARCTIC

2003 David Buckland (British, b. 1949) establishes the Cape Farewell project and launches the first voyage to Spitsbergen (Svalbard) with a collaborative team of artists, scientists, and educators to study climate change. The artists Heather Akroyd and Dan Harvey (British, b. 1959) join the group, and in 2010, Paul D. Miller (aka DJ Spooky, American, b. 1970) travels to the Arctic with the organization after traveling to Antarctica in 2008.

ANTARCTICA

2007 First zero-emissions polar science station built by the International Polar Foundation to conduct research on climate change.

2007-2009 Third International Polar Year spans two full years and stimulates over two hundred projects. It includes the most extensive Arctic climate change study to date, involving three hundred scientists and sixteen countries. Photographer Chris Linder (American, b. 1972) documents student scientists studying thawing permafrost in *The Polar Project: Science in Siberia* (2009).

2011 International Congress on Circumpolar Peoples sponsored by UNESCO (United Nations Educational, Scientific, and Cultural Organization).

FUELING THE ECONOMY

2005 Congress blocks oil drilling in the Arctic National Wildlife Refuge.

2009 President Barack Obama signs the American Recovery and Reinvestment Act, which allocates billions of dollars to alternative fuel development.

2012 The first Clean Air Act to limit carbon emissions for new power plants put forth by the Environmental Protection Agency (EPA) is made public.

CLIMATE SCIENCE

2002 Larsen B ice shelf, roughly the size of Rhode Island, collapses in Antarctica.

2006 Ice loss in Greenland doubles since 1996, according to NASA. *An Inconvenient Truth*, a film about global warming starring Al Gore, introduces climate change to a wider audience.

2007 Intergovernmental Panel on Climate Change (IPCC) reports that "the evidence for global warming is unequivocal and there is very high confidence that this is due to human activity." Over the past 150 years, the sea level has risen 8.66 inches (22 cm), and average global temperatures have risen 1.4° F.

2012 Warmest July since United States record keeping began fuels drought across the United States.

2000 CO2 = 370.06 ppm 2005 CO2 = 379 ppm 2006 CO2 = 381 ppm 2010 CO2 = 389.92 ppm
2011 CO2 = 391.65 ppm 2012 CO2 = 393.84 ppm February 2013 CO2 = 396.80 ppm May 9, 2013 = 400 ppm

The ice and the long moonlit polar nights, with all their yearning, seemed like a far-off dream from another world—a dream that had come and passed away. But what would life be worth without its dreams?

—Fridtjof Nansen, *Farthest North*, 1897