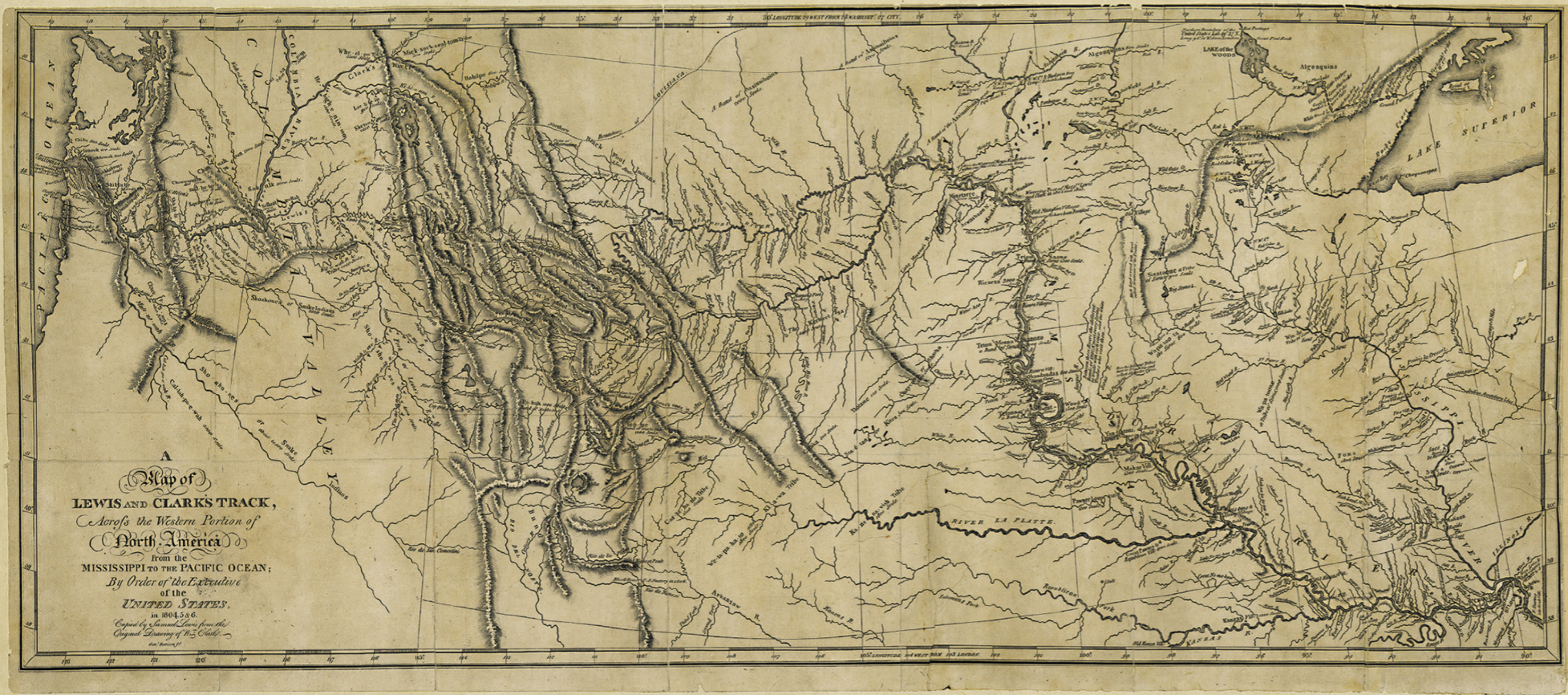


Lewis and Clark: A Legacy of Science



The Legacy



Even before the United States purchased the Louisiana Territory from France in 1803, President Thomas Jefferson had commissioned Meriwether Lewis to explore the continent west to the Pacific Ocean. For hundreds of years, the fabled Northwest Passage had inspired explorers as they tried to find a navigable route through North America. President Thomas Jefferson still envisioned the advantages such a water route would bring to the Nation when he instructed Meriwether Lewis about his mission.

A Map of Lewis and Clark's Track

Upon their return, Lewis and Clark ended the hope of a navigable water route across the continent via the Missouri River system. However, they brought with them knowledge of new lands and resources for the growing country. Clark used this knowledge to construct a new map of the West, which he completed in 1810. Information from William Danbar's exploration of the Ouachita River, Thomas Freeman's Red River expedition of 1806, James Wilkinson's descent down the Arkansas River, Zebulon Pike's expeditions to the southern Rockies and upper Mississippi River, and the 1807-08 exploration of the Yellowstone basin by former Corps of Discovery members George Drouillard and John Colter was incorporated into Clark's map.

The map to the left shows Lewis and Clark's route across the western part of North America from St. Louis to the Pacific Ocean. The map was copied by Samuel Lewis in 1814 from the original drawing by William Clark.

Mapping the Land

Lewis and Clark used a compass, sextant, octant, chronometer and other basic tools to determine latitude and longitude and to map features of the landscape. USGS cartographers used similar instruments to map the entire Nation up until the mid-1900s. As late as the 1960s, USGS map makers were still transporting their surveying equipment into remote areas using horses and mules.

Gaging the River's Flow

As they traveled up the Missouri, Lewis and Clark periodically measured the speed of the river's current. They probably did this by tying a stick to the end of a log-line, a light-weight rope of known length with knots at fixed intervals. Tossing the stick into the river, they measured the time it took for the rope to play out as the stick floated downstream.

Working with Native Americans

Jefferson instructed Lewis and Clark to "learn as much as you can about the inhabitants" of the lands through which they would travel. The expedition interacted with diverse groups of Native Americans, from the Osage along the lower Missouri westward to the Mandan, Shoshone, Nez Perce, and Chinook.

President Thomas Jefferson

Excerpts from his Instructions to Captain Meriwether Lewis

... The object of your mission is to explore the Missouri river, and such principal streams of it, as, by its course and communication with the waters of the Pacific Ocean, may offer the most direct and practicable water communication across this continent, for the purposes of commerce. Beginning at the mouth of the Missouri, you will take observations of latitude and longitude, at all remarkable points on the river, and especially at the mouths of rivers, at rapids, at islands and other places and objects distinguished by such natural mark and characters of a durable kind, as that they may with certainty be recognized hereafter. The courses of the river between these points of observation may be supplied by the compass, the log-line and by time, corrected by the observations themselves, the variations of the compass too, in different places, should be noticed.

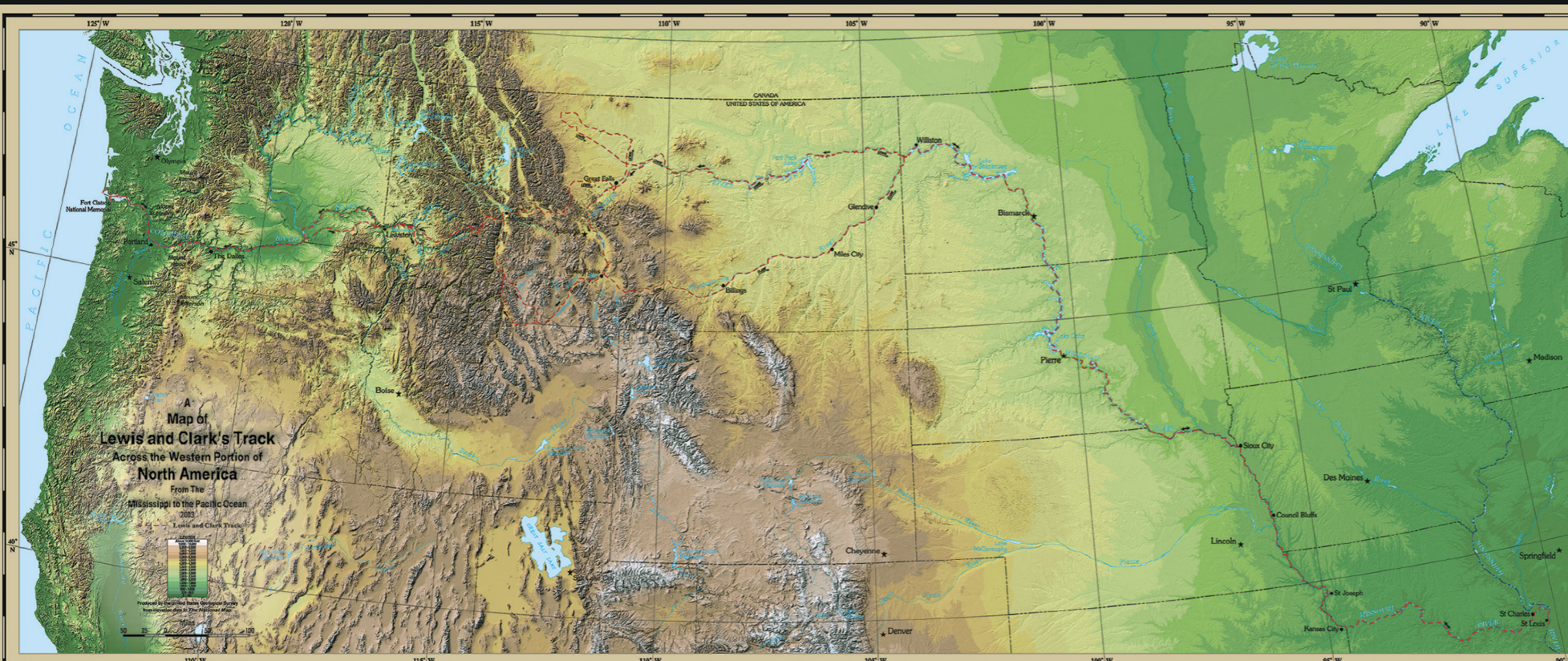
... Your observations are to be taken with great pains and accuracy, to be entered distinctly, and intelligibly, for others as well as yourself, to comprehend all the elements necessary.

Other objects worthy of notice will be the soil and face of the country, its growth and vegetable productions; especially those not of the U.S.; the animals of the country generally, and especially those not known in the U.S.; the remains and accounts of any which may be deemed rare or curious; the mineral productions of every kind; but more particularly metals, limestone, pit coal and saltpetre; saline and mineral waters, noting the temperature of the last, and such circumstances as may indicate their character. Volcanic appearances, climate as characterized by the thermometer, by the proportion of rainy, cloudy and clear days, by lightning, hail, snow, ice, by the excess and recess of frost, by the winds prevailing at different seasons, the dates at which particular plants put forth or lose their flowers, or leaf, times of appearance of particular birds, reptiles or insects.

... Given under my hand at the city of Washington, this 20th day of June 1803.

Thomas Jefferson, President, United States of America
(Jackson, D., ed., 1974, Letters of the Lewis and Clark Expedition with related documents, 1793-1854 (2d ed.), Urbana, Ill., University of Illinois Press.)

The original Lewis and Clark Map has been digitally enhanced and prepared by the U.S. Geological Survey. Reproduced from the original map held in the collection of the Library of Congress, Geography and Map Division.



Continuing the Legacy

Two hundred years later, the USGS, the Nation's largest earth science agency, carries on the legacy of surveying our natural heritage that began with Lewis and Clark. USGS scientists continue to map, measure, and monitor great river systems and the lands that border them. Although modern scientific tools, such as seismic monitoring devices and remote sensing, are far more sophisticated than those used by Lewis and Clark, the spirit of dedication and sense of discovery remain the same. In regard to surveying natural resources and applying scientific knowledge to the land, the USGS continues to do what Lewis and Clark began.

USGS Map of Today

The digitally produced shaded relief map to the left gives a much more detailed look at the same area mapped by William Clark. Elevation is represented as a range of colors, from dark green for low elevation to white for high elevations. For more information on elevation data from *The National Map*, please visit: <http://nationalmap.usgs.gov>.

Mapping the Land

USGS scientists today use many modern instruments to create detailed, extremely accurate maps of the Earth's surface. Using Doppler radar and satellite images, scientists can track slight variations in the elevation of a mountain, plot the changing course of a river, assess the health of crops, and monitor land use patterns over time.

Gaging the River's Flow

USGS stream flow gages now stand in strategic spots all along the length of the Missouri and Columbia Rivers. At these stations, the speed of the stream current is measured regularly. Newer instruments can measure the velocity of every square foot of water in a cross section of a river in less than 15 minutes. Real-time river-stage data are available at <http://water.usgs.gov/realtime.html>.

Working with Native Americans

The USGS provides unbiased scientific information to American Indian land and resource managers who use that information to respond to concerns about human health, natural resource use, and conservation. The USGS also encourages tribal members to pursue careers in science. Native American's knowledge of the land and its resources combined with generations of their observations complement scientific understandings and technologies to improve the lives of all Americans.

USGS Mission

With no regulatory or management mandates, the USGS serves the Nation as an independent fact-finding agency that collects, monitors, analyzes, and provides scientific understanding about natural resource conditions, issues, and problems. The value of the USGS to the Nation rests on its ability to engage in studies of the earth and life sciences on a national scale and to sustain long-term monitoring and assessment of natural resources.

The Library of Congress and USGS

The Library of Congress and the USGS have entered into an agreement to produce and disseminate historical cartographic products and exchange information. A *Map of Lewis and Clark's Track* is one of the first maps to be exchanged under this agreement.

President George W. Bush

Excerpts from the President's speech on the commemoration of the Lewis and Clark Bicentennial, July 3, 2002

... Nearly 200 years ago, President Jefferson sent an expedition to explore what was then the uncharted West. Jefferson was a curious man, and I bet you he wanted to lead the expedition himself. But he was occupied and so he chose a trusted aide and friend, Meriwether Lewis, to lead what was called the "Voyage of Discovery."

The Lewis and Clark expedition lasted just a couple of years, but it changed the face of our country forever. It opened up the American West for future development. It increased our knowledge of our natural resources. It helped us gain a better understanding of America's native cultures. Most importantly, the Lewis and Clark Expedition will stand forever as a monument to the American spirit: a spirit of optimism and courage and persistence in the face of adversity.

I have signed a proclamation designating 2003 through 2006 as the Lewis and Clark Bicentennial. I urge all Americans to learn more about Lewis and Clark and how the expedition changed our Nation, and at the same time, to earn more about our native culture, to learn more about coverage and the values that continue to shape our Nation today.

American history is filled with remarkable examples of heroism and adventure, and the voyage of Lewis and Clark is one of the most remarkable of them all. Their expedition became an epic of endurance and discovery, and that epic became an American legend which all Americans should know about, and they should teach their children about it, as well.

George W. Bush, President, United States of America
(Reference: <http://www.whitehouse.gov/the-press-office/2002/07/03/020703le.html>)

Adapted from:
Sacagawea, (Courtesy of Denver Public Library, Western History Collection, Call Number: 2.03.194)
Thomas Jefferson, (The White House Collection, Courtesy of the White House Historical Association)
George W. Bush, (The White House Collection, Courtesy of the White House)