

Experiencing Climate



Weathermen

President Thomas Jefferson gave instructions to Meriwether Lewis and William Clark regarding most facets of the 1804 expedition into and across the North American continent. Of particular mention is his instruction for them to record,

“climate, as characterised by the thermometer, by the proportion of rainy, cloudy & clear days, by lightning, hail, snow, ice, by the access & recess of frost, by the winds prevailing at different seasons, the dates at which particular plants put forth or lose their flower, or leaf, times of appearance of particular birds, reptiles, or insects.”

Expectations

What environmental conditions did Lewis and Clark expect to find along the Missouri River of the Great Plains and beyond? Were they expecting a tropical climate? A desert? A paradise of temperate weather, fertile ground and navigable waterways? Did they expect mighty snowpacks and torrential rain?

There is nothing to indicate that Lewis and Clark expected different *climate* from what they had known in the east. According to their journals Lewis did expect to find, a *“fertile and well-watered”* land and the rivers to be *“longer and deeper than any in the east.”* Because of this

Lewis believed that, *“our prospect for starving is therefore consequently small.”*

What they found was not extreme compared to today’s climate data for these areas, but for members of the expedition not used to the harsh conditions of the west, it created physical and psychological challenges that caused travel delays and hardship: dry sweltering summer heat, wind chills well below zero, ice jams, hail the size of pigeon eggs, thick fog and miserably cold rain, dense snowpacks, flash floods, snow and frost in summertime, and strong relentless winds.

Collecting Data

“The kind preferred is that on a lackered plate slid into a mahogany case with a glass sliding cover, these being best exposed on exposure to the weather.”

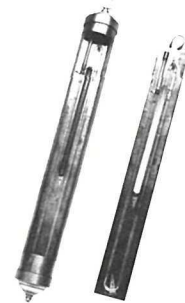
-a request by Pres. Thomas Jefferson on June 5, 1804 regarding the type of thermometer that should be used on the expedition

Meteorological science was not a true science as much as it was a hobby in the early-1800s in America. Thomas Jefferson was one of the leading scholars interested in tracking and recording weather. Most likely, he is the one who trained Meriwether Lewis on the calibration of thermometers using the boil and freeze method, the standard procedure of the day. Lewis documented using this method in January 1804 when he stated, *“testing it with water and snow mixed for the freezing point, and boiling water for the point marked boiling water.”*

Calibration of the instrument, consistent times and places of measurement, and proper recording all lead to more accurate data collection. Lewis and Clark measured the temperature with the thermometer and took notes in a separate “Weather Diary.” Recorded weather conditions included: temperature every day at sunrise and at 4:00 PM, precipitation types (rain, snow, hail) and amounts, water

levels of the river, tidal changes, and wind direction. This was the first systematic recording of meteorological data in land beyond the Mississippi River.

According to present-day meteorologists at the National Oceanic and Atmospheric Administration (NOAA), *“Lewis and Clark’s observations of temperature over a year on the High Plains were apparently of high quality, which was certainly due in large part to careful attention to the procedures employed.”*



- the above thermometer was manufactured in 1792 for use on ocean-going ships and represents a similar type of thermometer likely used by Lewis and Clark; NOAA photo.

Analyzing Data

“...void of timber of underbrush...immense herds of buffalo, elk, deer & antelopes feeding in one common and boundless pasture.”

- from the journals of William Clark

The American Meteorological Society has published several essays from scientists who have compared the weather data and observations of Lewis and Clark to data collected by modern weather stations along the same or similar points of the expedition route. For instance, winter air temperature and precipitation data taken by Lewis and Clark in North Dakota fall within the range of 20th-century data.

One theory is that the expedition was undertaken during a period of El Nino and La Nina phenomena that benefited the expedition by preventing periods of what ordinarily would have been major drought conditions

Climate Change

What seemed to be harsh climactic conditions to the expedition members of the east may simply have been expected conditions for those indigenous people who had been living in this region for generations.

Since the time of Lewis and Clark, the world's population has increased 6-fold; there has been the advent of the automobile, the airplane, an increase in industry and manufacturing, agribusiness, fossil fuel consumption, new technologies, and overall development of the land. For many, these changes have disconnected them from the land. For example,

and severe temperatures in the High Plains. These may also have caused the heavy snowfall in the Lemhi and Bitterroot Mountains, and resulted in higher than average rainfall in the Pacific Northwest. Perhaps these phenomena accounted for more abundant food sources in the years 1804-1806 than may have been available under “normal” conditions. For instance, as evidenced in their journals, grasses were abundant for grazing animals such as bison, elk, and deer. Additionally, the growing season for corn was more suitable, which enabled American Indians surplus corn for trade; another benefit to the expedition members' survival.

the food we eat and the water we drink we did not grow or collect ourselves. We go to the grocery store or turn on the water faucet to get the things necessary for our survival. These lifestyle changes and population increases result in adverse affects on the earth, particularly when we over-use the earth's resources.

According to the *Climate Change 2007* report published by the Intergovernmental Panel on Climate Change, in the last 100 years the earth's surface temperatures have risen an average 0.74°C (1.33°F). Since 1850, 11 of the 12 warmest years on record occurred from 1996-2006.

Concerns of Today

James Hansen, NASA's chief climate scientist has said, “*We are getting close to a tipping point...Several degrees of temperature rise are unavoidable. The changes will be substantial, but something to which we can probably adapt. However, if we stay on a business as usual path for another decade, the impacts will be dire.*”

We have already seen the consequences of a “*business as usual path.*” Glaciers and deep snowpacks that Lewis and Clark and expedition members witnessed in the Rocky Mountains no longer exist.

Human beings are as much connected to life on earth today as ever before; we still all share the same planet and depend on it for our health and well being. It is critical that we also share an awareness of how our lifestyle choices impact the earth and even more critical that we change lifestyle habits that have negative impacts.

Do Your Part

Use public transportation, walk, carpool with friends, or ride a bike whenever possible.

Purchase solar and wind generated power and “carbon credits” to help off set your emissions.

When it is time to replace the family vehicle, consider one that gets more miles per gallon than your present vehicle.

Convert home and office lighting to compact fluorescent bulbs. Turn off unnecessary lights.

When buying an appliance, look for the EnergyStar® label identifying energy-efficient models.

Buy products that feature reusable, recyclable, or reduced packaging to save the energy required to manufacture new containers.

Educate others. Let friends and family know about these practical, energy-saving steps they can take to save money while protecting the environment.

Become a “Planet Protector”:

<http://www.epa.gov/osw/education/kids/planetprotectors/index.htm>

Calculate your carbon contribution at: <http://www.b-e-f.org/calc>; then reduce it.

Join WasteWise recycling programs and sustainable practices programs: <http://www.epa.gov/epawaste/partnerships/wastewise/join.htm>

Encourage scientific research and public discussion on global warming and solutions such as energy efficiency and alternative energy.

References

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“*Humankind has not woven the web of life. We are but one thread within it. Whatever we do to the web, we do to ourselves. All things are bound together. All things connect. We are a part of the earth and it is part of us.*”

- Chief Seattle

