

## **Appendix 7**            **Endorheic Basins**

An endorheic (endoreic or endorreic) basin is a closed hydrologic drainage basin. Normally, water in a drainage basin flows out through rivers or streams on the Earth's surface or by underground diffusion through permeable rock, ultimately ending up in the oceans.

Endorheic regions, which tend to be located far inland, can occur in any climate but are most commonly found in desert locations, with their boundaries defined by mountains or other geological features that block their access to oceans. Since the inflowing water can escape only through seepage or evaporation, dried minerals or other products collect in the basin, eventually making the water saline – the bottom of such basins are typically occupied by a salt lake or salt pan.

Both permanent and seasonal endorheic lakes can form in endorheic basins. Some endorheic basins are essentially stable, climate change having reduced precipitation to the degree that a lake no longer forms. Even most permanent endorheic lakes change size and shape dramatically over time, often becoming much smaller or breaking into several smaller parts during the dry season. As humans have expanded into previously uninhabitable desert areas, the river systems that feed many endorheic lakes have been altered by the construction of dams and aqueducts. As a result, many endorheic lakes in developed or developing countries have contracted dramatically, resulting in increased salinity, higher concentrations of pollutants, and the disruption of ecosystems. A lake may be endorheic during dry years and can become exorheic during wet years when it overflows its basin, eg the former Tulare Lake in California.

Because the Earth's climate has recently been through a warming and drying phase with the end of the Ice Ages, many endorheic areas such as Death Valley that are now dry deserts were large lakes relatively recently. During the last ice age, the Sahara may have contained lakes larger than any now existing.

Continents vary in their concentration of endorheic regions due to conditions of geography and climate. Australia has the highest percentage of endorheic regions at 21% while North America has the least at 5% Approximately 18% of the earth's land drains to endorheic lakes or seas, the largest of these land areas being the interior of Asia.

### **The Great Divide Basin**

The Great Divide Basin or Great Divide Closed Basin is an endorheic basin which adjoins the Continental Divide in south central Wyoming. To the west is the Green River watershed, draining to the Gulf of California/Pacific Ocean; to the east is the North Platte watershed, draining to the Gulf of Mexico/Atlantic Ocean. The basin is very roughly rectangular in shape; the northwest corner is in the Wind River Range near South Pass, about 40 miles southwest of Lander, and the southeast corner is in the Sierra Madre Range near Bridger Pass, about 20 miles southwest of Rawlins.

Although the Great Divide Basin provides a relatively low and easy crossing of the Continental Divide, its aridity and endorheic nature were an obstacle to pioneers during the westward expansion of the United States, and was known as the *Saline*

*Plain* around the 1870s. Consequently, the Oregon Trail detoured north over South Pass, and the Overland Trail detoured south over Bridger Pass. Even today the basin is very sparsely populated, the only incorporated town being Wamsutter, with a population of 451 at the 2010 census.

While usually thought of as a single basin, the Great Divide Basin is actually several contiguous sub-basins, most notably those centered on Circle Bar Lake, Frewen Lake, Lost Creek Lake, Red Lake, and Separation Lake. The interior ridges separating these sub-basins have led to disagreement about the correct path of the Continental Divide across or around the basin.

The Lucite Hills form part of the western boundary of the basin, featuring Black Rock Butte and Emmons Cone. Alkali Flat and Greasewood Flat are directly to their northeast. Sand dunes lie in the central western part of the basin. In the southern part of the western basin, Red Desert Flat and Red Desert Basin are the major features. These are about 25 miles northwest of the town of Wamsutter. In the northeast part of the Great Divide Basin is Chain Lakes Flat, southwest and downslope from Bairoil and Lamont.

The basin is a high desert dominated by sand dunes, bluffs and alkali flats. Flora and fauna include small trees in some ravines and the occasional shrub, along with many birds (e.g., sage grouse and pheasant) and pronghorn, mule deer, feral horses, and the occasional elk. The basin includes uranium ore deposits and many oil and natural gas wells. There has been debate between those that wish to utilize the resources within the basin and those that wish to see at least parts of it officially designated as wilderness.

