

Foreword



Sacramento/San Joaquin River Delta

From the San Francisco Bay/Delta to the Florida Everglades and from upstate New York to Houston, people are dealing with a common problem in these diverse locations—land subsidence due to the withdrawal of ground water or the application of water at the land surface. These locations illustrate that subsidence is not an isolated problem: an area of more than 15,000 square miles in 45 States experience land subsidence. Using these locations and others as case studies, this report focuses on three principal processes causing land subsidence: the compaction of aquifer systems, the oxidation of organic soils, and the collapse of cavities in carbonate and evaporite rocks. The impacts of land subsidence, past and present, are illustrated, and most importantly, so is the value of science in effectively limiting damages from land subsidence.

An important aspect of the USGS mission is to provide information that describes the Earth, its resources, and the processes that govern the availability and quality of those resources. With reports such as this Circular, the USGS seeks to broaden public understanding of land subsidence as an Earth process, and the serious impacts that subsidence can cause if those impacts are not understood, anticipated, and properly managed. By applying scientific understanding and engineering approaches to problems of land subsidence, our society will have solutions that can mitigate or eliminate the negative impacts of subsidence while allowing continued beneficial uses of water. It is our hope that this information will be helpful for concerned citizens, landowners, water users, water managers, and officials responsible for public investments and regulation of land and water use.

For some readers, this report will be an end in itself in providing an understanding of the phenomena of land subsidence that satisfies their need to act as informed citizens or decision makers, or simply to satisfy their curiosity about an important Earth process. For other readers, we hope this report will be a gateway to the rich scientific literature on the subject of subsidence and strategies for the control of subsidence, through the references provided.

Scientific understanding is critical to the formulation of balanced decisions about the management of land and water resources. This Circular coupled with ongoing data collection, basic research, and applications of that research to specific subsidence problems, constitute the USGS contribution toward wise management of land subsidence as a part of effective and publicly beneficial land- and water-management strategies.

Robert M. Hirsch

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Associate Director for Water Resources