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Review of *Atlas of Oklahoma Climate* by Howard L. Johnson and Claude E. Duchon

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Atlas of Oklahoma Climate. Howard L. Johnson and Claude E. Duchon. Norman: University of Oklahoma Press, 1995. xii+32 pp. Maps, tables, and figures. \$29.95 cloth (ISBN 0-8061-2689-2).

Thematic atlases depicting aspects of past weather events and climatic summaries are an important resource for researchers, educators, and the general public. The authors of the *Atlas of Oklahoma Climate* have produced an engaging text providing a good overview of a subject about which both are highly knowledgeable: Howard Johnson serves as an Assistant State Climatologist in the Oklahoma Climatological Survey; Claude Duchon is a Professor in the School of Meteorology at the University of Oklahoma.

The atlas is divided into six major sections: an "Introduction"; "Geography and Oklahoma's Weather and Climate"; "Annual Climate"; "Seasonal Climate"; "Wind and Humidity"; and "Climate and Agriculture." The written text makes frequent reference to the over 150 accompanying black and white illustrations that comprise the larger part of the publication. Illustrations are primarily isoline maps showing the geographic pattern of selected climate elements and graphs depicting data from either specific weather stations or representations of temporal variations in a selected climatic variable. The net result is an excellent resource destined to be found in public libraries across Oklahoma and the Great Plains and in the personal book collections of individuals fascinated by the weather and climate of Oklahoma.

A brief preface identifies the authors' goals and also provides a number of sources for those desiring additional climatic information. The introductory chapter provides basic definitions of weather and climate, as well as indicating the weather recording stations and sources of the archived data used in assembling the numerous illustrations that accompany the text. Local

and regional geographic influences and the jet stream's control over seasonal weather variations are discussed in Chapter 2, "Geography and Oklahoma's Weather and Climate." Physiography, topography, and natural vegetation maps assist in communicating spatial variations.

Precipitation and temperature are the major themes of Chapter 3, "Annual Climate." Sixteen illustrations accompany the discussion of various aspects of annual temperature and precipitation data, such as mean temperature, number of days over 100°F, length of the growing season, heating and cooling degree days, number of days with measurable precipitation, mean annual precipitation, and annual snowfall total. The chapter also includes a discussion of major state-wide droughts and floods.

"Seasonal Climate," the fourth chapter and by far the largest, accompanied as well by the greatest number of illustrations (over 100), begins with a discussion of seasonal and monthly variations in both temperature and precipitation, then covers thunderstorms, hail, and tornadoes. The rest of the chapter, divided into four seasonal sections, offers maps of seasonal and monthly maximum and minimum temperatures, monthly precipitation totals, and the number of days with measurable precipitation. For each season there are additional figures dealing with the date of the last spring freeze, runs of hot weather, the date of the first autumn freeze, and runs of winter cold. Mean snowfall maps for autumn, winter, and spring and the months of December, January, and February are also presented and discussed.

"Wind and Humidity," Chapter 5, highlights two important components of the way living things experience weather and climate variations. Annual and seasonal variations in wind direction and speed are described with the assistance of 29 wind rose diagrams. Variations in atmospheric moisture are discussed on both daily and seasonal time scales. Accompanying graphs show temperature, relative humidity, and dew point temperature. The final chapter, "Climate and Agriculture," discusses a number of relevant applied climatic elements. Choropleth maps showing county-level winter wheat and cotton production (1991 data) are followed by growing degree-day maps relevant to both cool and warm season crops. Additional discussion addresses the mean dates of last (spring) and first (autumn) hard freezes (28°F) and the monthly (May - October) and annual geographic distributions of evaporation amounts.

The *Atlas of Oklahoma Climate* is an excellent resource that could have been even better had it cited other published works on the subject. **John A. Harrington, Jr.**, *Department of Geography, Kansas State University*.