FRBSF Weekly Letter

August 19, 1988

# Drought and the West

This summer, a severe drought has gripped much of the nation, bringing less-than-normal rainfall and higher-than-normal temperatures. In the West, the effects of the drought have been less severe than those in other parts of the country, largely because much of the West relies on reservoirs for summer water. Nonetheless, water shortages and rationing are prevalent in some areas, as two consecutive dry winters have left reservoirs seriously depleted.

On balance, most farmers in the West should make it through the summer of 1988 with little or no damage, and some may even benefit from the higher prices that result from reduced agricultural production in other parts of the country. Some cattle ranchers are likely to suffer this year, however, and another dry winter would cause more widespread problems. Over the longer term, the region's future will depend in part on how water supply issues are resolved.

### Drought conditions

In much of the West, winter snows in the mountains are the primary source of water. The spring runoff from these snows supplies a vast network of reservoirs and rivers, providing water for the summers, when measurable rainfall is unusual. In the coastal areas of Washington and Oregon, where precipitation is more abundant and scattered more evenly throughout the year, the water holding systems are relatively less extensive.

From the fall of 1986 through the spring of 1988 precipitation throughout the West was significantly below normal. As a result, reservoirs became seriously depleted. In western Washington and Oregon, the shortage became critical, with the threatened loss of some of this area's fruit trees. Fortunately, plentiful spring rains in the coastal areas of the Northwest replenished these reservoirs. In other parts of the West, however, low reservoir levels continue to be a source of serious concern. Reservoirs in California, for example, currently contain only 65 percent of normal reserves, inducing some urban water districts in the San Francisco and Los Angeles areas to institute water rationing.

### Agricultural impacts

Even though water levels in reservoirs are below normal capacity, western farmers continue to receive adequate water supplies this season. Consequently, western agricultural production may not suffer serious cutbacks, while enjoying the 40 percent boost in feed grain and hay prices associated with diminished midwestern production. In any event, most western crop production is in specialty crops, fruits, and vegetables that should be largely unaffected by the drought. If precipitation is low next winter, however, a critical shortage would develop and crop losses could be severe.

For cattle ranchers, in contrast, the immediate problems are more serious. The dry weather has reduced the usefulness of substantial areas of western pasture land as a source of nourishment for cattle. At the same time, higher grain prices have driven up feed costs. Since ranchers throughout the nation are having trouble feeding their herds at the current high feed costs, many are selling earlier than they otherwise would. The resulting six percent drop in the price of beef cattle between May and June, together with high feed costs, is making it difficult for ranchers to turn a profit. In parts of the West where pasture conditions are adequate, ranchers may profit by holding cattle off the market until the widely-anticipated shortage develops next year and prices are higher.

### Long-range implications

The current water shortage underscores the fundamentally arid nature of the climate in much of the West. Clearly, resolution of the problems of water supply will affect the region's future substantially. As urban areas become more populous,

THE WESTERN ECONOMY *The Western Economy* is a quarterly review of economic conditions in the Twelfth Federal Reserve District. It is published in the *Weekly Letter* on the third Friday of February, May, August and November.

and the residential demand for water increases, conflicting demands on the region's scarce water resources will mount. For example, during the past few years, growing demand for water in Arizona's cities has led to "water ranching." Urban water districts are buying farmland in order to obtain the water rights associated with the land.

In California as well, the transfer of water rights from agricultural to urban water districts is becoming a more feasible option. Recent court rulings have opened the door for sales of water rights, and urban users place a higher value on each gallon of water than farmers do. Consequently, as urban areas continue to grow, water sales are likely to become more common. Thus, the way in which the long-term water supply issues are resolved will shape future growth in the West.

**Carolyn Sherwood-Call**
**Economist**

# District Economic Conditions

Overall, the economy of the Twelfth Federal Reserve District continued to grow through the second quarter of 1988. Problems in some states, however, dropped the pace of employment growth in the West to 2 percent, 1.3 percentage points below that of the nation.

Continued growth across most industries in California and Washington and new strength in Utah were the economic bright spots in the second quarter. Growing export markets boosted manufacturing in these states. In California, manufacturing and service sector employment gains of 2.3 and 4.5 percent, respectively, in June offset slow employment growth early in the second quarter. Washington posted robust employment growth of 3.5 percent, thanks to strong demand for commercial aircraft and expansion in the construction sector. The addition of manufacturing and service jobs led Utah to an unemployment rate of 4.8 percent in June. Business services were a major source of strength in Utah, posting a 10 percent gain in employment over last year. Within Utah's manufacturing industry, primary metals, computers, space and defense, chemicals and petroleum, and textiles registered employment gains from a year ago.

Other states in the West posted slower growth in the second quarter. Trouble spots differed greatly. After a solid first quarter, employment growth in Oregon slowed to 0.9 percent because a series of strikes and the mild winter, which pushed second-quarter logging employment growth into the first quarter, led to the loss of normal second quarter growth in lumber jobs. In Idaho, employment gains in manufacturing early in the quarter were partially erased in June, causing a 3.3 percentage point slowdown from first quarter growth. Job losses in Nevada's service sector dampened the effects of continued strength in the mining industry which has increased employment 30 percent in the last year. In Hawaii, 5 percent growth in service sector employment offset declines in manufacturing.

Troubles in industries that are doing well nationwide slowed employment growth in some western states. In Alaska, lower-than-usual seasonal hiring in the manufacturing sector overshadowed employment gains in the mining and service industries. However, the slowdown in manufacturing in Alaska appears to have abated in June as seafood processing plants added workers for the salmon season. Arizona, in a reversal of previous strong growth, actually lost jobs at a 1.6 percent rate because of continued losses of construction and service jobs and declines in manufacturing employment growth.

Growth in the District is expected to continue at a healthy pace, although employment growth may lag that of the nation slightly. Export growth should spur manufacturing and trade in the West, but emerging capacity constraints in California, Oregon, and Washington could limit the rate of expansion.

**Stephen O. Dean**
**Research Associate**

## DISTRICT INDICATORS
(SEASONALLY ADJUSTED)

| | 88Q2 | 88Q1 | 87Q4 | 87Q3 | 87Q2 | 87Q1 | 86Q4 | 86Q3 | % CHANGE FROM: 88Q1 | 87Q2 |
|---|---|---|---|---|---|---|---|---|---|---|
| AGRICULTURE | | | | | | | | | | |
| U.S. CROP PRICES, 1985=100 | 103.9 | 102.4 | 100.5 | 99.9 | 98.7 | 95.6 | 95.4 | 97.2 | 1.47 | 5.23 |
| DISTRICT CROP PRICES, 1985=100 | 92.8 | 97.7 | 103.2 | 100.3 | 100.5 | 97.3 | 92.0 | 92.0 | -4.92 | -7.57 |
| FARM CASH RECEIPTS, MILLION $ | 2287.3 | 2265.0 | 1986.5 | 2160.8 | 2132.4 | 2029.3 | 1945.8 | 1826.0 | 0.99 | 7.27 |
| CATTLE ON FEED, 1985=100 | 92.8 | 93.5 | 95.1 | 94.3 | 85.2 | 82.1 | 81.0 | 83.7 | -0.69 | 8.95 |
| CATTLE PRICES, CALIFORNIA, $/CWT. | 63.2 | 61.6 | 57.8 | 58.0 | 56.4 | 52.4 | 49.4 | 47.5 | 2.73 | 12.15 |
| FORESTRY | | | | | | | | | | |
| LUMBER PRODUCTION, MILLIONS BOARD FEET | 1685.8 | 1729.9 | 1762.6 | 1760.8 | 1770.2 | 1796.8 | 1822.0 | 1659.1 | -2.55 | -4.77 |
| NORTHWEST LUMBER INVENTORY, MIL. BOARD FEET | 2516.8 | 2507.8 | 2477.2 | 2609.5 | 2639.3 | 2578.3 | 2606.8 | 2527.1 | 0.36 | -4.64 |
| U.S. LUMBER PRICES, 1985=100 | 113.4 | 110.6 | 109.4 | 111.8 | 107.2 | 104.1 | 101.5 | 102.1 | 2.51 | 5.72 |
| ENERGY | | | | | | | | | | |
| SPOT PRICE OF OIL, $/BARREL | 17.3 | 16.7 | 18.7 | 20.4 | 19.3 | 18.2 | 15.3 | 13.8 | 4.02 | -10.38 |
| U.S. RIG COUNT | 1061.7 | 973.8 | 1002.2 | 1037.5 | 880.0 | 810.5 | 786.9 | 751.2 | 9.03 | 20.65 |
| DISTRICT RIG COUNT | 96.9 | 79.1 | 99.5 | 102.9 | 82.6 | 60.1 | 61.8 | 62.1 | 22.57 | 17.28 |
| FUEL MINING EMPLOYMENT, 1985=100 | 79.1 | 77.2 | 77.9 | 78.2 | 77.6 | 76.0 | 77.1 | 77.4 | 2.53 | 2.01 |
| U.S. SEISMIC CREW COUNT | 201.9 | 199.1 | 189.8 | 181.9 | 173.8 | 157.5 | 152.3 | 151.4 | 1.42 | 16.21 |
| MINING | | | | | | | | | | |
| MINERAL PRICES, 1985=100 | 148.8 | 155.0 | 149.1 | 130.1 | 119.2 | 108.1 | 104.8 | 102.8 | -4.01 | 24.89 |
| METAL MINING EMPLOYMENT, 1985=100 | 147.3 | 141.4 | 131.8 | 126.8 | 119.7 | 111.7 | 102.6 | 96.8 | 4.15 | 23.09 |
| CONSTRUCTION | | | | | | | | | | |
| NONRESIDENTIAL AWARDS | 1318.5 | 1467.5 | 1595.6 | 1492.6 | 1504.2 | 1450.6 | 1405.4 | 1452.0 | -10.15 | -12.35 |
| RESIDENTIAL PERMITS | 30907 | 27923 | 28694 | 30783 | 30200 | 32517 | 41469 | 36123 | 10.69 | 2.34 |
| WESTERN HOUSING STARTS, THOUSANDS | 37.0 | 28.5 | 27.9 | 37.6 | 40.1 | 34.3 | 35.5 | 40.6 | 29.56 | -7.81 |
| CONSTRUCTION EMPLOYMENT, THOUSANDS | 956.6 | 945.6 | 916.9 | 909.9 | 905.8 | 901.3 | 895.6 | 872.3 | 1.16 | 5.61 |
| MANUFACTURING | | | | | | | | | | |
| WAGES, CALIFORNIA, $/HOUR | 10.8 | 10.8 | 10.9 | 10.8 | 10.7 | 10.6 | 10.5 | 10.4 | 0.49 | 1.24 |
| EMPLOYMENT, THOUSANDS | 3087.5 | 3086.4 | 3056.1 | 3024.7 | 3004.1 | 2991.1 | 2982.7 | 2950.3 | 0.04 | 2.78 |
| DURABLES, 1985=100 | 102.1 | 102.2 | 101.1 | 100.4 | 99.7 | 99.3 | 99.1 | 98.8 | -0.06 | 2.48 |
| CONSTRUCTION DURABLES, 1985=100 | 109.7 | 110.8 | 108.4 | 107.6 | 107.4 | 107.1 | 105.9 | 102.9 | -0.92 | 2.16 |
| AEROSPACE, 1985=100 | 115.7 | 115.9 | 114.7 | 113.4 | 112.2 | 111.1 | 109.5 | 108.9 | -0.17 | 3.10 |
| ELECTRONICS, 1985=100 | 98.1 | 98.0 | 97.2 | 95.9 | 94.9 | 94.7 | 94.6 | 94.4 | 0.07 | 3.43 |
| SEMICONDUCTOR ORDERS, MILLIONS, NOT S.A. | 1269.0 | 1126.2 | 1056.8 | 967.3 | 980.7 | 912.4 | 757.5 | 688.3 | 12.68 | 29.40 |
| WHLS/RETAIL TRADE EMPLOYMENT, THOUSANDS | 4494.4 | 4462.2 | 4383.9 | 4347.1 | 4306.4 | 4259.6 | 4234.3 | 4211.6 | 0.72 | 4.36 |
| RETAIL SALES, PACIFIC DISTRICT, MIL. $ | 20389 | 20615 | 20133 | 19722 | 19531 | 18947 | 19015 | 18895 | -1.09 | 4.39 |
| SERVICES EMPLOYMENT, THOUSANDS | 4674.8 | 4647.6 | 4587.1 | 4533.8 | 4486.5 | 4424.1 | 4347.8 | 4291.4 | 0.58 | 4.20 |
| HEALTH CARE, 1985=100 | 113.4 | 112.7 | 111.4 | 110.1 | 108.7 | 107.7 | 106.0 | 105.0 | 0.60 | 4.29 |
| BUSINESS SERVICES, 1985=100 | 119.2 | 118.6 | 115.9 | 115.1 | 113.5 | 111.3 | 109.2 | 107.3 | 0.48 | 5.06 |
| HOTEL, 1985=100 | 117.0 | 116.3 | 114.9 | 112.2 | 110.6 | 108.8 | 106.4 | 105.0 | 0.60 | 5.75 |
| RECREATION, 1985=100 | 108.1 | 109.3 | 108.2 | 106.1 | 106.6 | 105.4 | 103.3 | 103.8 | -1.08 | 1.41 |
| FINANCE, INSUR. AND REAL ESTATE EMPLOYMENT | 1213.6 | 1215.8 | 1209.2 | 1204.5 | 1196.2 | 1182.6 | 1169.2 | 1157.5 | -0.18 | 1.45 |
| GOVERNMENT EMPLOYMENT, THOUSANDS | | | | | | | | | | |
| FEDERAL GOVERNMENT | 606.0 | 610.3 | 609.9 | 605.3 | 605.2 | 601.0 | 599.5 | 596.5 | -0.71 | 0.14 |
| STATE AND LOCAL | 2596.4 | 2570.1 | 2551.1 | 2527.3 | 2502.3 | 2490.0 | 2479.4 | 2466.5 | 1.02 | 3.76 |

Data are weighted aggregates of available 12th District states and are expressed as monthly rates unless otherwise noted. District Indicator data are constructed by FRBSF research staff from public and industry sources.

**Opinions expressed in this newsletter do not necessarily reflect the views of the management of the Federal Reserve Bank of San Francisco, or of the Board of Governors of the Federal Reserve System.**
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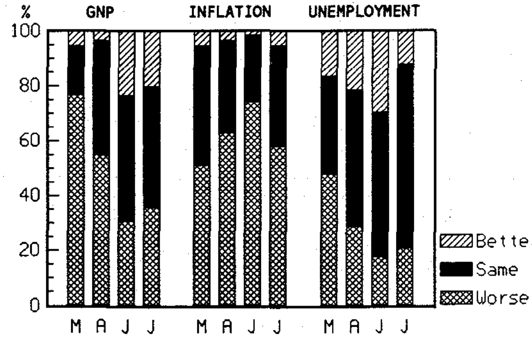
PERSONAL INCOME
ANNUALIZED PERCENT GROWTH RATES

| | 88Q1 | 87Q4 | 87Q3 | 87Q2 | 87Q1 | ANNUAL GROWTH 1988 | 1987 | 1986 |
|---|---|---|---|---|---|---|---|---|
| ALASKA | -4.2 | 3.1 | -0.5 | 5.2 | -10.7 | -4.2 | -0.9 | -2.7 |
| ARIZONA | 4.9 | 11.2 | 6.3 | 6.8 | 5.8 | 4.9 | 7.5 | 8.1 |
| CALIFORNIA | 3.9 | 10.2 | 5.9 | 6.6 | 9.7 | 3.9 | 8.1 | 7.0 |
| HAWAII | 2.5 | 12.2 | 8.5 | 6.2 | 5.0 | 2.5 | 8.0 | 7.2 |
| IDAHO | 9.4 | -0.3 | 11.8 | 4.2 | 1.0 | 9.4 | 4.1 | 3.0 |
| NEVADA | 8.3 | 8.8 | 10.4 | 8.0 | 6.7 | 8.3 | 8.5 | 8.2 |
| OREGON | 7.7 | 8.6 | 7.6 | 4.9 | 3.5 | 7.7 | 6.1 | 5.2 |
| UTAH | 0.1 | 7.7 | 2.9 | 7.2 | 2.6 | 0.1 | 5.1 | 2.7 |
| WASHINGTON | 6.8 | 9.8 | 6.4 | 4.8 | -2.5 | 6.8 | 4.5 | 8.4 |
| 12TH DISTRICT | 4.4 | 9.8 | 6.1 | 6.3 | 7.0 | 4.4 | 7.3 | 6.8 |
| U.S. | 4.6 | 11.6 | 7.1 | 6.7 | 8.8 | 4.6 | 8.5 | 5.9 |

TWELFTH DISTRICT BUSINESS SENTIMENT INDEX*
(1988)




*The index is constructed from a survey of approximately 75 business leaders in the 12th Federal Reserve District.

NON-AGRICULTURAL EMPLOYMENT
ANNUALIZED PERCENT GROWTH RATES

| | 88Q2 | 88Q1 | 87Q4 | 87Q3 | 87Q2 | ANNUAL GROWTH 1988 | 1987 | 1986 |
|---|---|---|---|---|---|---|---|---|
| ALASKA | -5.9 | 1.4 | 4.9 | -4.6 | -1.1 | -2.3 | -1.7 | -6.4 |
| ARIZONA | -1.6 | 3.4 | 4.0 | 3.0 | 2.0 | 0.9 | 3.1 | 4.1 |
| CALIFORNIA | 2.4 | 5.3 | 3.3 | 3.5 | 3.9 | 3.9 | 3.6 | 2.5 |
| HAWAII | 1.6 | 4.7 | 7.4 | 1.9 | 2.6 | 3.1 | 3.8 | 2.6 |
| IDAHO | 1.1 | 4.4 | 3.2 | 2.9 | 4.0 | 2.8 | 1.0 | -0.2 |
| NEVADA | 1.5 | 7.5 | 7.0 | 5.9 | 6.9 | 4.5 | 6.7 | 5.8 |
| OREGON | 0.9 | 6.9 | 3.8 | 2.8 | 3.9 | 3.9 | 3.5 | 2.7 |
| UTAH | 3.2 | 0.8 | 2.8 | -0.4 | 1.2 | 2.0 | 1.3 | 1.0 |
| WASHINGTON | 3.5 | 4.8 | 5.4 | 4.2 | 4.1 | 4.2 | 4.5 | 3.6 |
| 12TH DISTRICT | 2.0 | 5.0 | 3.8 | 3.3 | 3.7 | 3.5 | 3.5 | 2.6 |
| U.S. | 3.3 | 3.8 | 4.0 | 3.3 | 3.2 | 3.6 | 3.3 | 2.0 |

UNEMPLOYMENT RATES
AVERAGE QUARTERLY DATA

| | 88Q2 | 88Q1 | 87Q4 | 87Q3 | 87Q2 | ANNUAL AVG. 1988 | 1987 | 1986 |
|---|---|---|---|---|---|---|---|---|
| ALASKA | 8.9 | 9.3 | 10.1 | 10.6 | 11.2 | 9.1 | 10.8 | 10.9 |
| ARIZONA | 5.7 | 5.6 | 6.0 | 6.1 | 6.3 | 5.7 | 6.3 | 6.9 |
| CALIFORNIA | 5.7 | 5.2 | 5.4 | 5.5 | 5.9 | 5.4 | 5.7 | 6.7 |
| HAWAII | 2.9 | 3.5 | 3.8 | 3.8 | 4.0 | 3.2 | 4.0 | 4.9 |
| IDAHO | 6.5 | 7.4 | 7.3 | 7.4 | 8.2 | 6.9 | 8.0 | 8.8 |
| NEVADA | 5.7 | 6.0 | 6.0 | 6.3 | 6.5 | 5.9 | 6.3 | 6.0 |
| OREGON | 6.1 | 6.0 | 5.7 | 5.8 | 6.1 | 6.0 | 6.2 | 8.5 |
| UTAH | 5.0 | 5.5 | 5.9 | 6.4 | 6.6 | 5.2 | 6.4 | 6.0 |
| WASHINGTON | 6.5 | 7.0 | 7.4 | 7.4 | 7.7 | 6.8 | 7.6 | 8.2 |
| 12TH DISTRICT | 5.7 | 5.5 | 5.8 | 5.9 | 6.2 | 5.6 | 6.1 | 7.0 |
| U.S. | 5.4 | 5.7 | 5.9 | 6.0 | 6.2 | 5.6 | 6.2 | 7.0 |