

America's Drought

**“When the well is dry, we learn the worth of water”
--Benjamin Franklin**

Prepared 3/1/05

The National Drought Mitigation Center defines drought as “a normal, recurrent feature of climate, although many erroneously consider it a rare and random event,” whereby a region or regions experience severe water shortage. Drought can occur at any time of year and in any region of the U.S. for weeks, months and even years at a time. Several western states are currently experiencing a drought in its ninth year.

Drought has an impact on every sector of the economy:

- Reduced productivity and devastation of crop and range lands causing higher food prices and direct losses to the agricultural industry.
- Unemployment from drought related declines in production.
- Increased energy costs to consumers associated with substituting more expensive processes, like burning oil, for hydroelectric power.
- The alteration of our daily routines from municipal water restrictions.

Drought costs billions of dollars every year:

- The Federal Emergency Management Agency (FEMA) has estimated that drought **costs the United States \$6-8 billion annually**, while floods and hurricanes annually average \$2.41 billion and \$1.2 to \$4.8 billion, respectively.

Drought can encompass and impair major regions of the U.S.:

- According to the National Oceanic and Atmospheric Administration (NOAA), long-term drought rapidly expanded during the first half of 2002 to reach a peak area coverage of about **39% of the country**.
- The National Climatic Data Center (NCDC) noted that in 2002, drought over large portions of 30 states including the western states, the Great Plains, and much of the eastern U.S. **caused damages estimated to cost over \$10 billion**.
- For 2002 the USDA designated counties in **47 states across the country** as agricultural disaster areas eligible for assistance due to drought impacts on farm production.
- While rainfall is always welcome in dry states, it unfortunately, does not solve drought conditions. Most rainfall either cannot be captured or eventually flows into the sea. The amount of rain is oftentimes not enough to replenish **severely depleted ground-water supplies**. The melt-off from snow caps, on the other hand, can alleviate the extent of a drought.
- States the drought hit hardest in 2002 such as California, Colorado, Utah, Arizona, Nevada, New Mexico, Idaho, Wyoming, Washington, South Dakota, North Dakota, Kansas, Nebraska and Montana **continue to encounter drought conditions to this day**.

Drought is not a rare but regular occurrence:

- NOAA found that there have been **12 different drought events since 1980** that resulted in damages and costs exceeding \$1 billion each.

What has the federal government done?

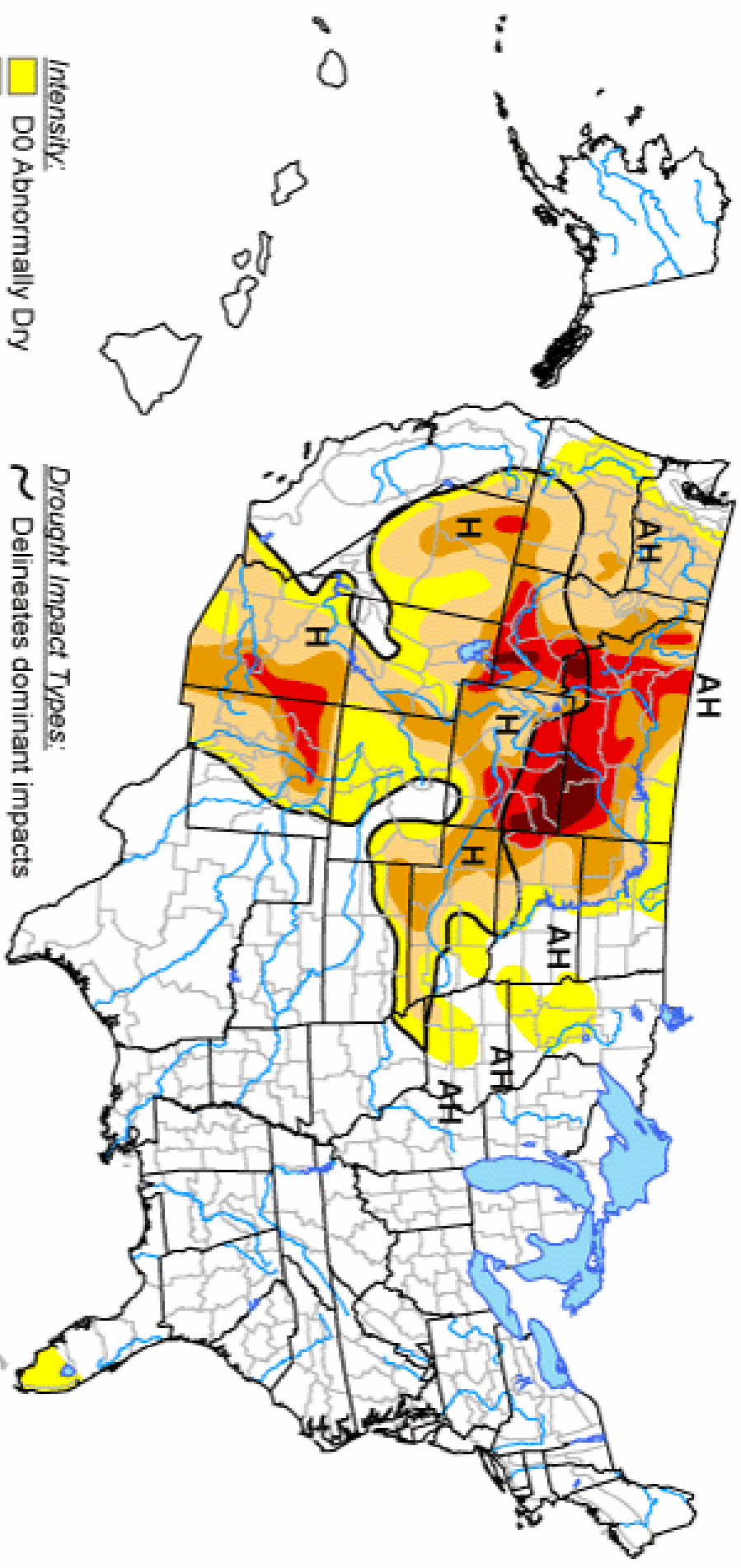
In the past few years, Congress has passed billions of dollars in drought relief packages that provide a short-term fix to a long-term problem. Though the federal government has achieved inroads on a state by state basis, such as the recent passage of CALFED for California, Congress has yet to fully act against drought on a national basis.

- In 2004, Congress passed **\$2.9 billion in drought relief** for farmers and ranchers.

U.S. Drought Monitor

February 8, 2005

Valid 7 a.m. EST



- Intensity:**
- D0 Abnormally Dry
 - D1 Drought - Moderate
 - D2 Drought - Severe
 - D3 Drought - Extreme
 - D4 Drought - Exceptional

- Drought Impact Types:**
- Delineates dominant impacts
 - A = Agricultural (crops, pastures, grasslands)
 - H = Hydrological (water)
 - (No type = Both impacts)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



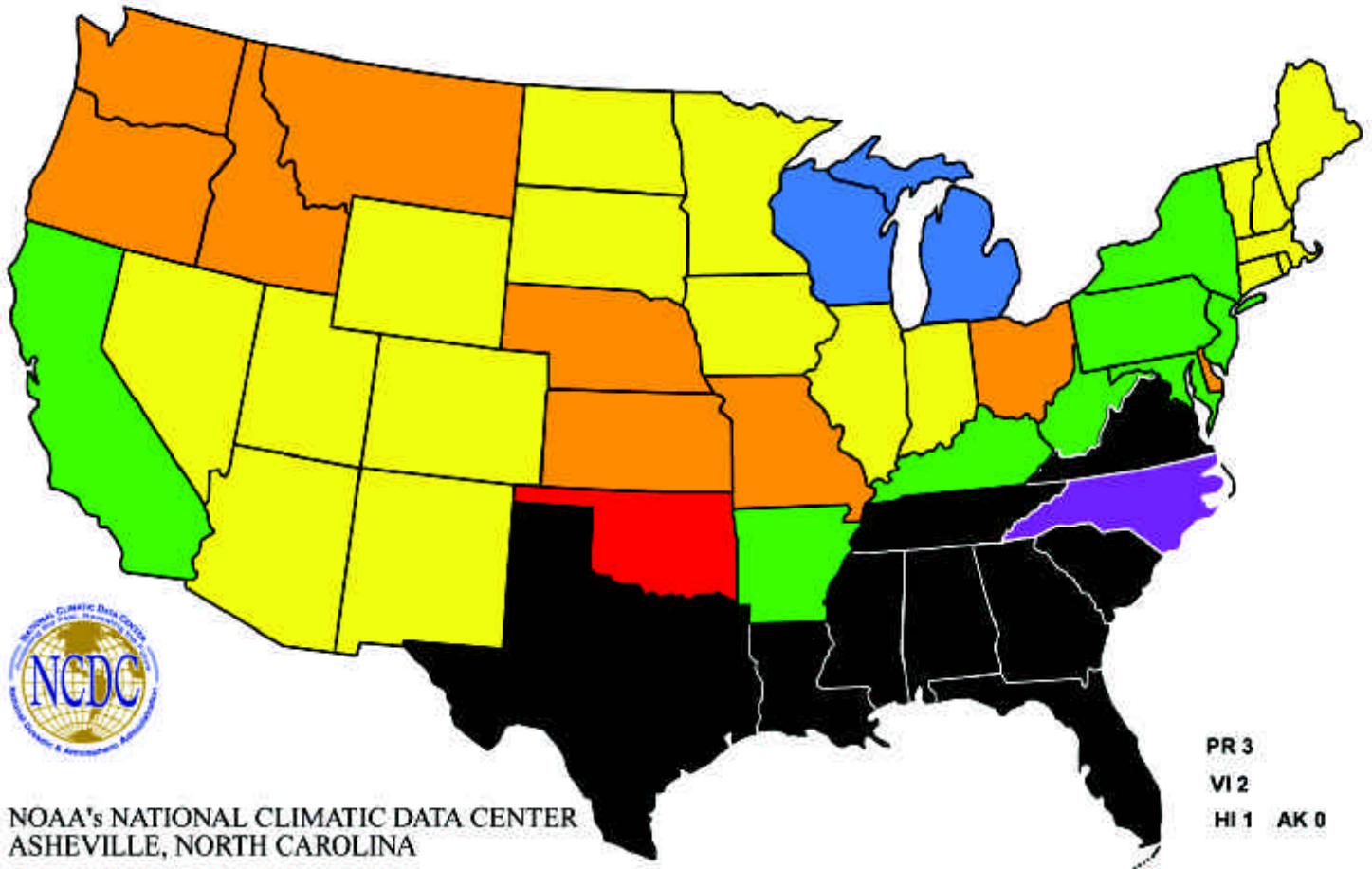
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<http://drought.unl.edu/dm>

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Billion Dollar Climate and Weather Disasters 1980 - 2004



NOAA's NATIONAL CLIMATIC DATA CENTER
ASHEVILLE, NORTH CAROLINA

PR 3
VI 2
HI 1 AK 0

NUMBER OF EVENTS	DISASTER TYPE	NUMBER OF EVENTS	PERCENT FREQUENCY	NORMALIZED DAMAGES (Billions of Dollars)	PERCENT DAMAGE
1 - 3	Tropical Storms/Hurricanes	20	32.3%	144	36.8%
4 - 6	Non-Tropical Floods	12	19.4%	55	14.1%
7 - 9	Heatwaves/Droughts	10	16.2%	144	36.8%
10 - 12	Severe Weather	7	11.3%	13	3.3%
13 - 15	Fires	6	9.6%	13	3.3%
16 - 20	Freezes	2	3.2%	6	1.6%
	Blizzards	2	3.2%	9	2.3%
	Ice Storms	2	3.2%	5	1.3%
21 - 25	Noreaster	1	1.6%	2	0.5%
		62		391	

Please note that the national map color-coded by state reflects a summation of billion dollar events, for each state affected--i.e. it does not mean that each state shown suffered at least \$1 billion in losses for each event.

Desalination Can Help Alleviate America's Drought

“[We need] a farsighted program for meeting urgent water needs by converting saltwater to fresh water.”

Dwight D. Eisenhower, 1951

Prepared: 3/1/05

Desalination is a reliable flow of freshwater that can quench America's thirst:

With the U.S. facing a water supply crisis of immense proportions, all reasonable, cost-effective and environmentally benign means of developing new potable water supplies that are immune to drought conditions should be pursued. Desalination – the process of removing salt from seawater and brackish water – is exactly such a means. Desalination plants produce guaranteed amounts of freshwater at increasingly lower costs every year, even through drought conditions. Given further advances in technology, desalination holds the promise of being a component of the long-term solution to America's drought.

Desalination is a cost-effective component in the fight against drought:

- Although desalination has been utilized for centuries, the energy intensive nature of the technology had made it an impractical water source except for oil-rich nations such as Saudi Arabia (which depends on desalination for 70% of its water supply). However, significant advances in membrane and other **technologies have dramatically reduced the costs associated with desalination.**
- The cost for traditional water supplies has risen to the point where desalination technology is now very competitive. In 1992, the cost to desalinate an acre-foot of water was about \$2,000. Now, that **cost is less than \$800 per acre-foot.**
- For example, Tampa Bay Water officials have indicated that, at the desalination plant there, current water supplies cost roughly \$3/1,000 gallons to produce, while it is expected to produce water at close to \$2/1,000 gallons. **Cost savings from the project are anticipated to be worth \$300 million over a 30-year period.**

Desalination can help relieve drought conditions for inland areas:

- While the advantages of building desalination plants along coastal regions are obvious – with their unlimited access to seawater – **many interior states stand to benefit due to supplies of brackish water that can be converted into water for drinking.**
- **Virtually no state in America is immune from drought conditions.** Coastal states, such as California and Washington, have been as hard hit as states located in America's interior such as Kansas and Nebraska.
- **Developing a vibrant desalination industry will help drought-stricken interior states by reducing the need to draw ever greater amounts of water from common sources.** For example, Nevada, Arizona, Colorado, Utah Wyoming and New Mexico are five interior states that depend upon water from the Colorado River. By utilizing desalination of seawater to a greater degree, California, which also relies on Colorado River water, would require less water from that seriously depleted source.

What should the federal government do?

- Once a dream, desalination technology is now at a stage where, with the involvement of the federal government working with the private sector, it can become an integral component of a long-term solution to America's water shortage problem.
- **H.R. 1071** would establish a program, within the Department of Energy, to provide Energy Assistance Payments to desalination projects following a competitive process. Funding for the program would come from DOE's renewable energy program. **A modest funding request for a crisis of such enormous magnitude,** the bill calls for two hundred million dollars to be authorized over a five year span.
- **The federal government should pass H.R. 1071 and finally provide the nation with a long-term solution to America's current and future droughts.**

U.S. Population Growth and Water Scarcity

**“Where there is scarcity, population increase aggravates it.”
--U.S. President’s Council on Sustainable Development**

Freshwater is a limited resource in high demand:

Only 3% of the entire world’s water is fresh water. According to the Congressional Research Service (CRS), “subtracting saline ground water and inland saline seas from the remainder, less than 0.5 % of the Earth’s water is directly suitable for human consumption, agricultural or industrial uses.” These competing interests constantly vie for this incredibly valuable resource. Skyrocketing population growth in metropolitan areas continues to strain available and quickly diminishing water supplies.

The U.S. population has and will increase nationwide, driving up water demands:

- The U.S. has the highest population growth rates of any industrialized country in the world. According to the U.S. Census Bureau, the population doubled from 135 to more than 270 million during the past 60 years and is **projected to double again to 540 million** in the next 70 years.
- According to the U.S. General Accounting Office (GAO), tremendous population growth, driving increases in the use of the public water supply, is anticipated in the Western and Southern states, areas that are already taxing existing water supplies.

Rising population figures strain America’s water resources:

- According to the Pipeline and Gas Journal, the U.S. population has grown 52% in the last 30 years, while the **total water usage per person has tripled**.
- Current trends such as declining ground water levels and increasing population indicate that the freshwater supply is reaching its limits in some locations while freshwater demand is increasing. Groundwater provides 31% of the water used in U.S. agriculture and is, on average, **being depleted 25% in excess of recharge rates**.
- Cornell Professor David Pimentel has noted that even if water management is substantially improved by 2070 will our water supplies per capita will be considered to be too little if we are to maintain current irrigated crop and livestock production.

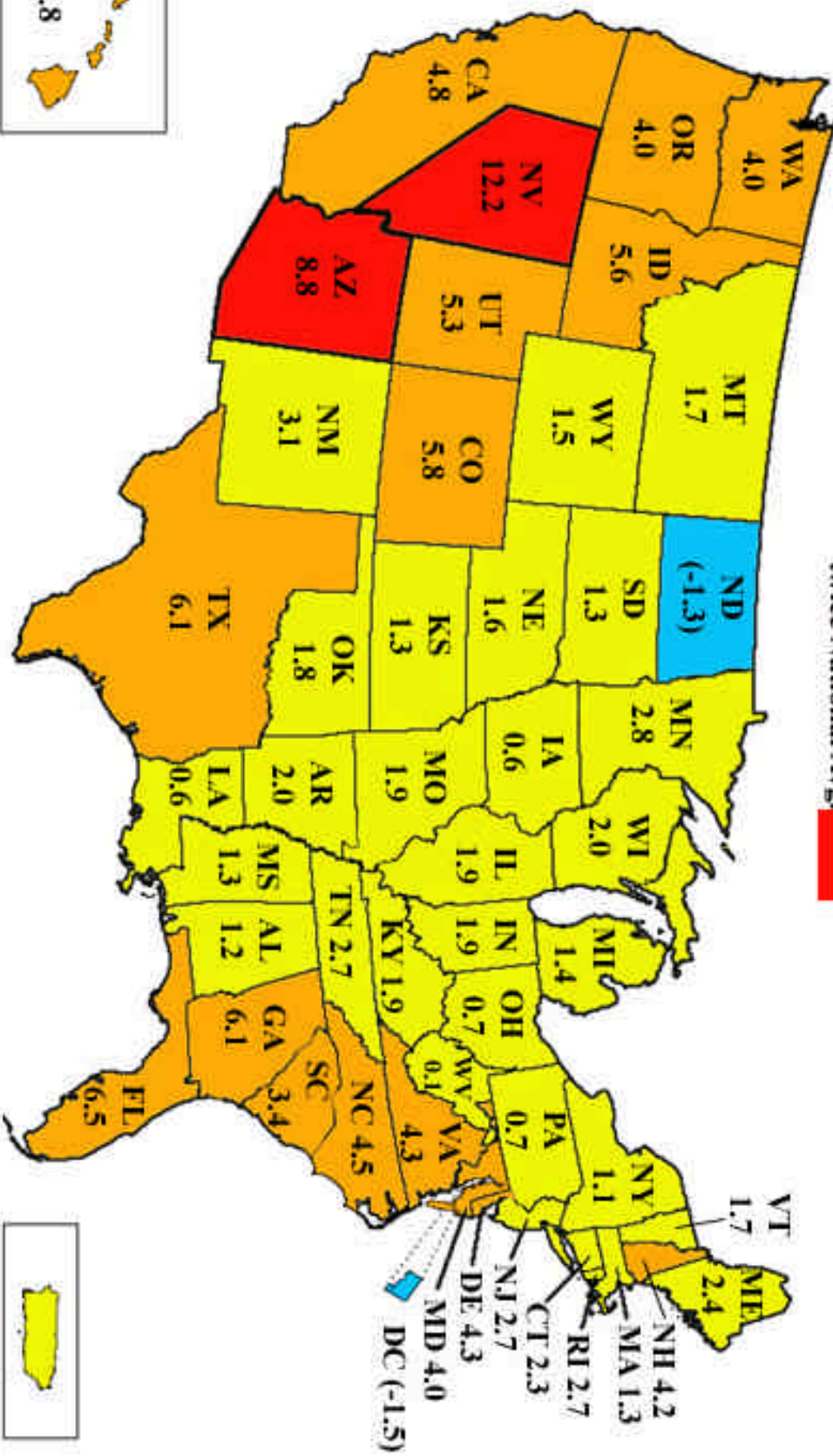
Sprawling cities add to American water woes:

- The Natural Resources Defense Council recently reported that “as the impervious surfaces that characterize sprawling development—roads, parking lots, driveways, and roofs—replace meadows and forests, **rain no longer can seep into the land to replenish our groundwater supply**. Instead, it is swept away by gutters and sewer systems.”
- According to the U.S. Army Corps of Engineers, from 1970 to 1990, more than 30,000 square miles (19 million acres) of once rural land in the U.S. became urban. **Metro areas have grown from 9 to 19% of U.S. land area since 1960**.
- The GAO has stated that **even under normal water conditions 36 states anticipate water shortages in the next ten years**. Swelling cities and suburbs’ water needs will only serve to exacerbate these shortages.



Percent Change in U.S. Population: 2000 - 2003

scale based on U.S. National Average

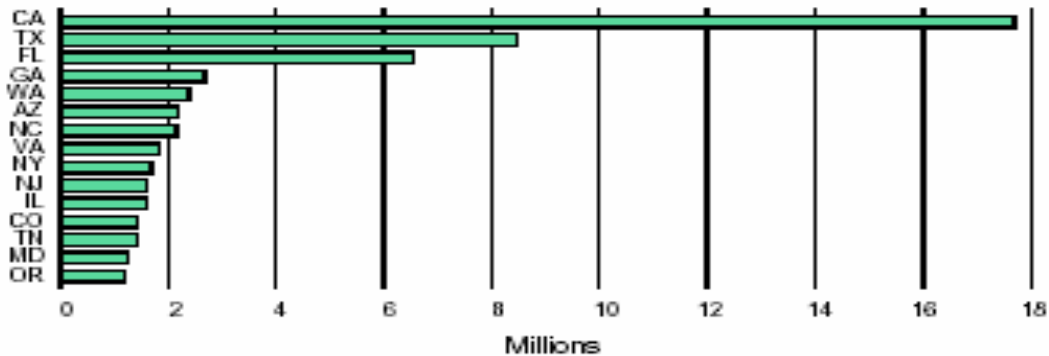


Projected Population Growth from 1995 to 2025

Figure 1.

Most of the Increase is in the South and West

States with the largest projected net increase in population: 1995 to 2025

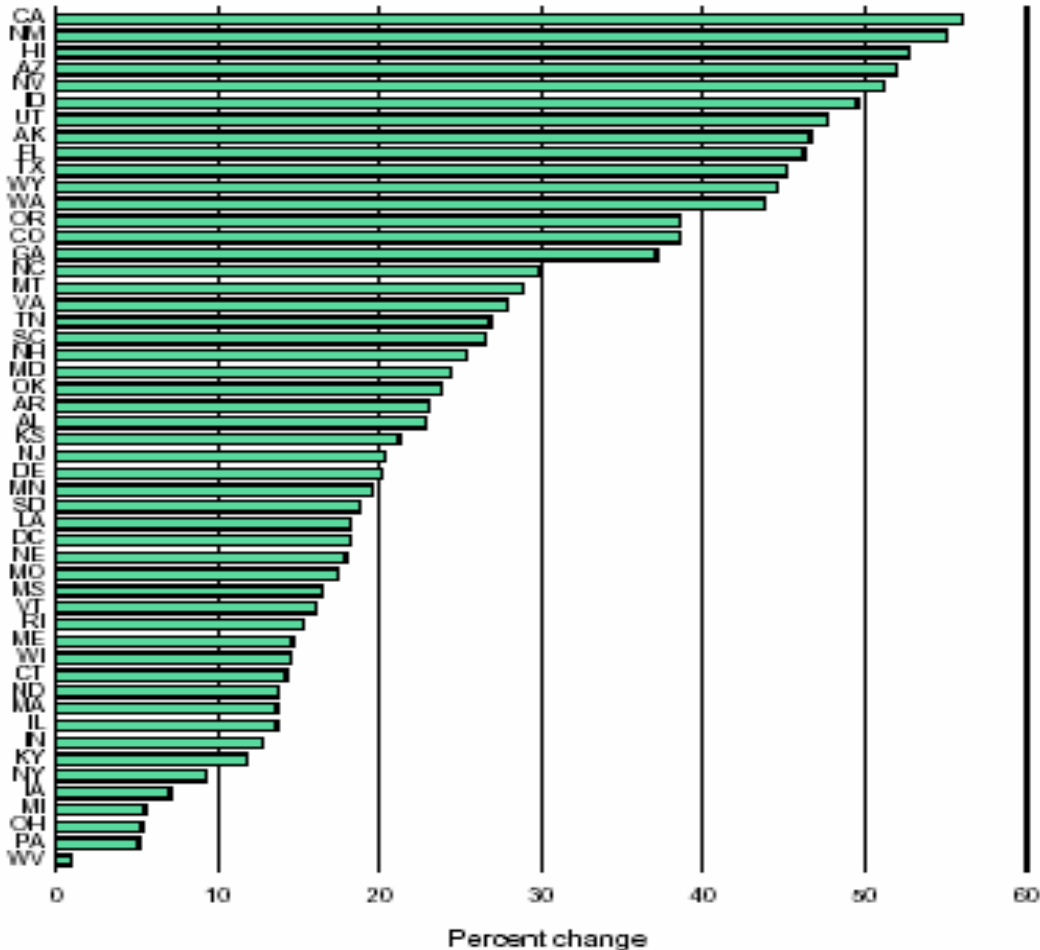


Source: U.S. Bureau of the Census, Population Division, PPL-47.

Figure 2.

Fastest-Growing States

States ranked by percent change in population: 1995 to 2025



Source: U.S. Bureau of the Census, Population Division, PPL-47.