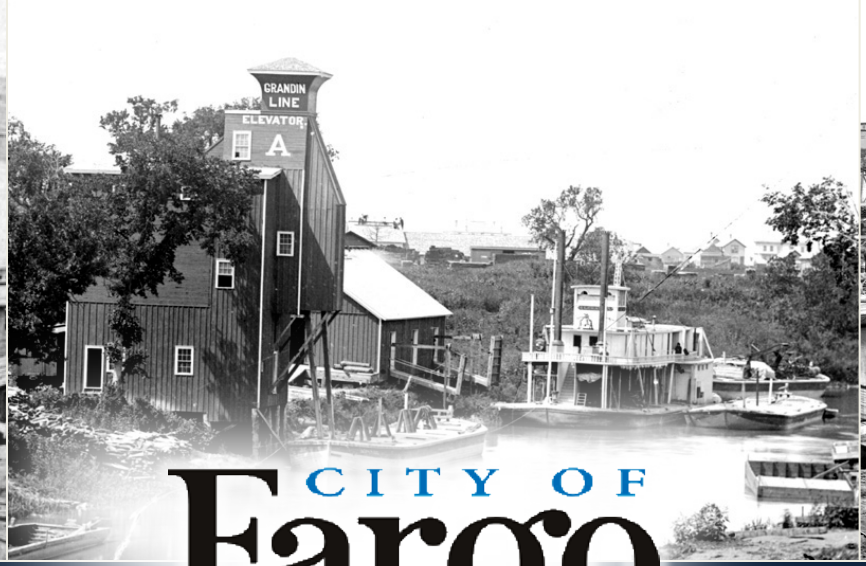
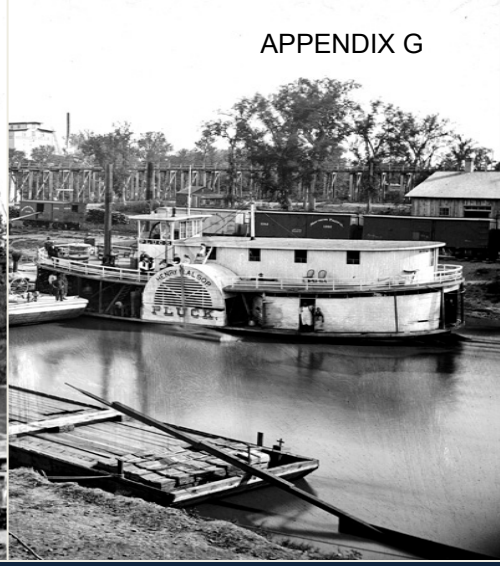
APPENDIX G





CITY OF Fargo

WATER SUPPLY NEEDS

Interim Water Topics Committee Meeting

September 5th, 2013

TOO WET / TOO DRY PARADOX

Red River 2009

Red River 1988

Red River 1936

Red River 2009

TOO WET / TOO DRY PARADOX

Wednesday, August 28, 2013

Red stopped flowing a year after summer flood of 1975

WEATHER TALK

In 1975, 26.30 inches of rain and melted snow were recorded. At the time, it was the 15th-wettest year on record.

Much of the excessive rain that year occurred in June, when 9.40 inches were recorded. That June rain was even heavier south of Fargo, and that led to severe summer flooding on both the Red and Sheyenne rivers, among others. With so much water, thoughts of water shortages was likely not on anyone's mind that summer.

Yet, a year later, in 1976, the Red River in Fargo gradually stopped flowing. Only 8.84 inches of rain and melted were recorded in Fargo-Moorhead that year, with most of the region also receiving scant precipitation. With summer temperatures finishing well above average, the lack of rain in combination with high evaporation rates led to many rivers running dry by that autumn.

From summer flood in 1975 to barely a trickle in 1976, such events in our climate are to be expected, and it will likely occur again in the future.

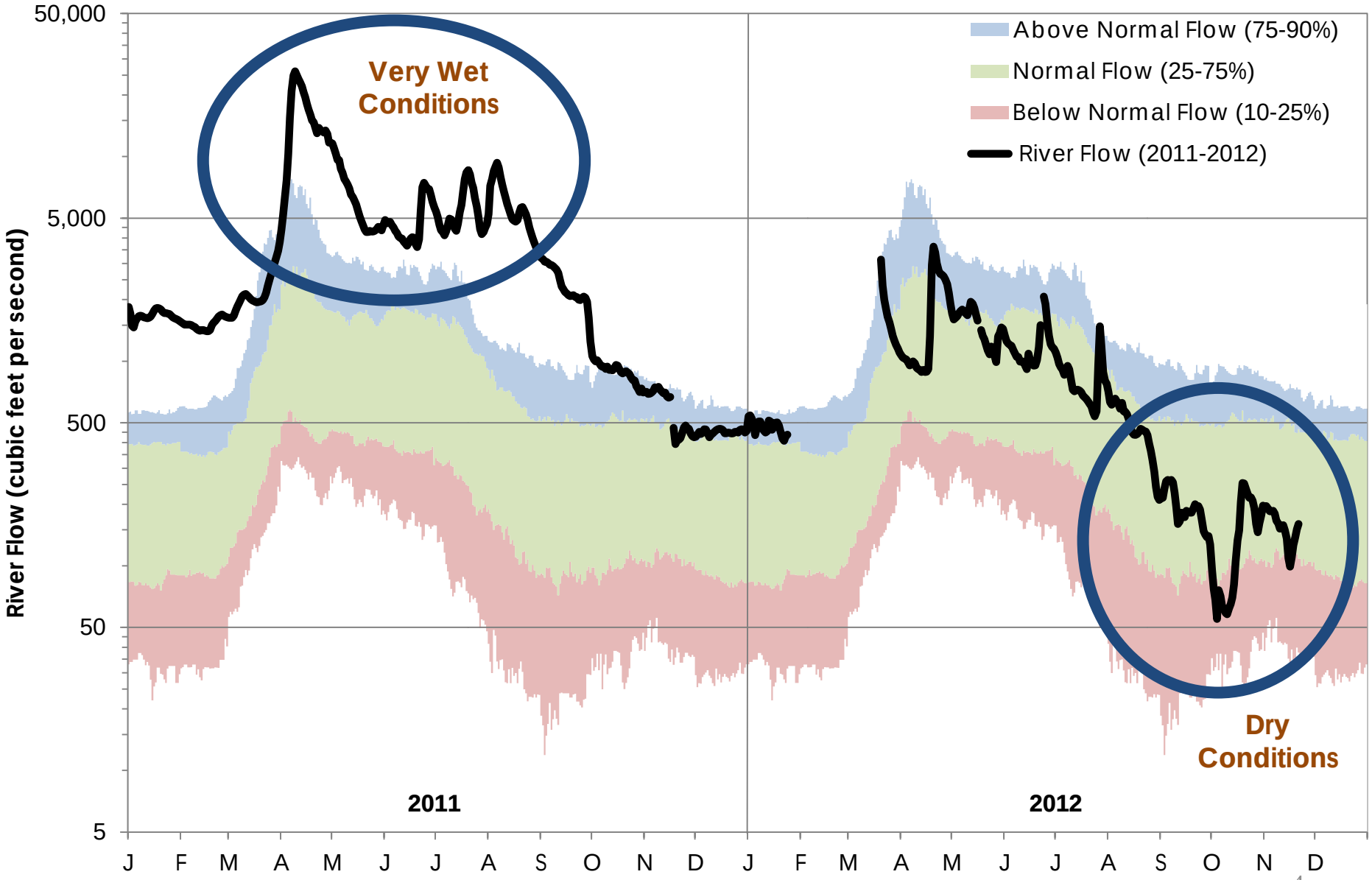
– Daryl Ritchison

Have a weather question you'd like answered? Email weather@wday.com, or write to WDAY Stormtracker, WDAY-TV, Box 2466, Fargo, ND 58108

- Extreme flatness of Red River Valley leads to susceptibility for flooding and drought
- Change can occur quickly
- Proven in 1975 and 2012

RED RIVER AT FARGO

2011-2012 River Flow Versus Historical Percentiles Since 1908

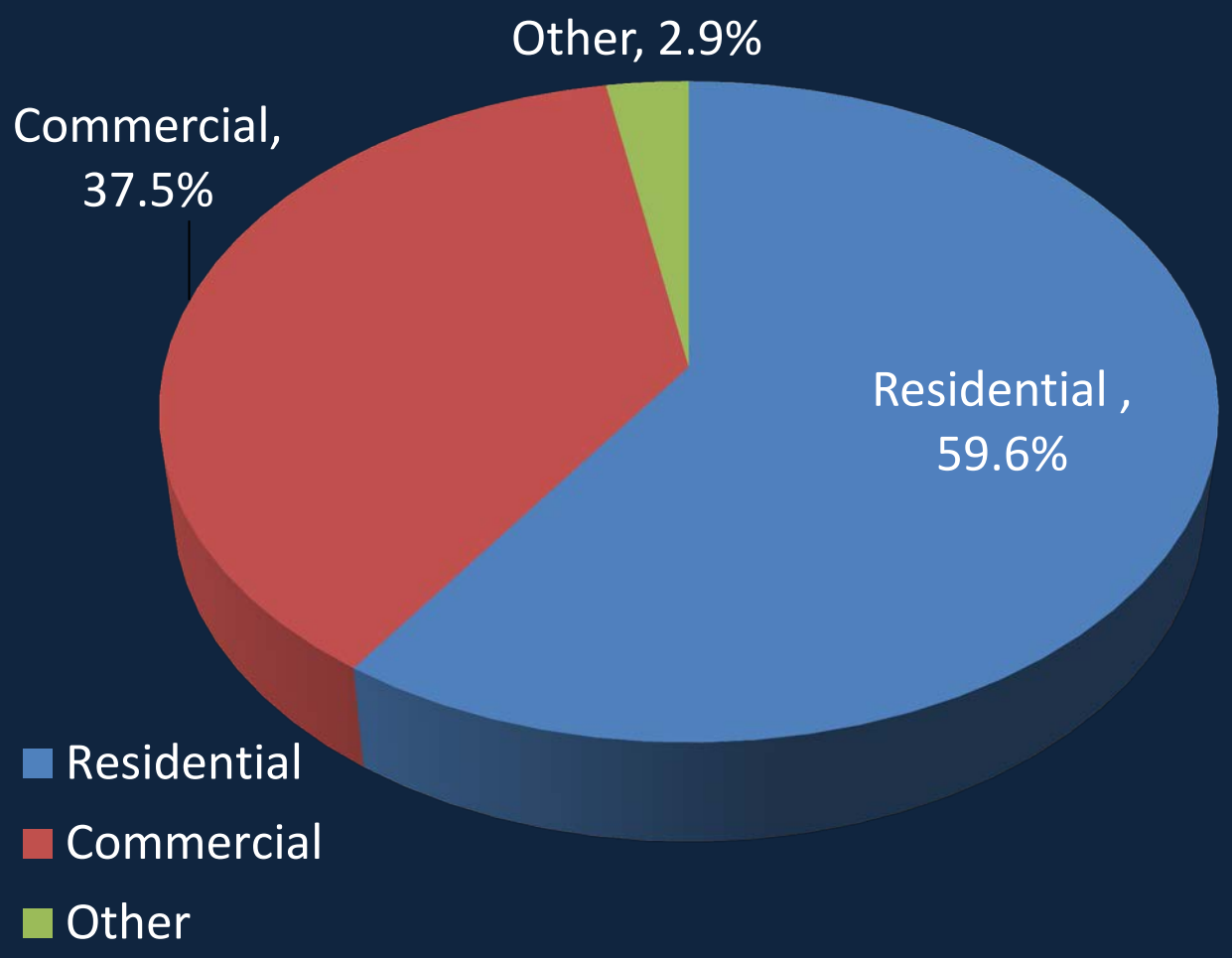


WATER SUPPLY NEEDS

- Existing Red River Valley water supplies will be inadequate during drought
- A 1930s type drought would be devastating to our water supplies
- Expected economic impact ≈ **$20 Billion over 10 years**
- The water supply needs will continue to grow

NEEDS

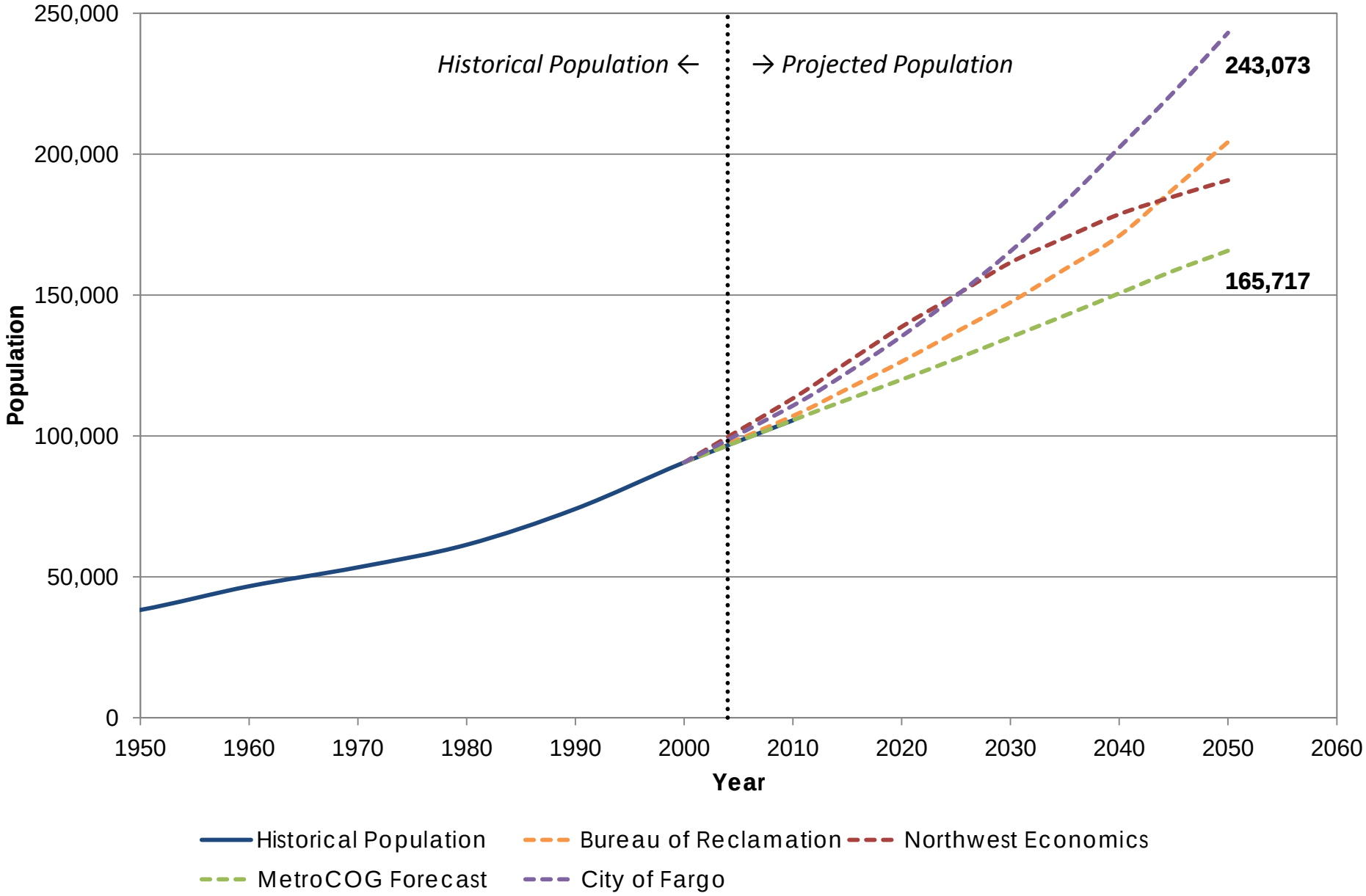
City of Fargo Water Users



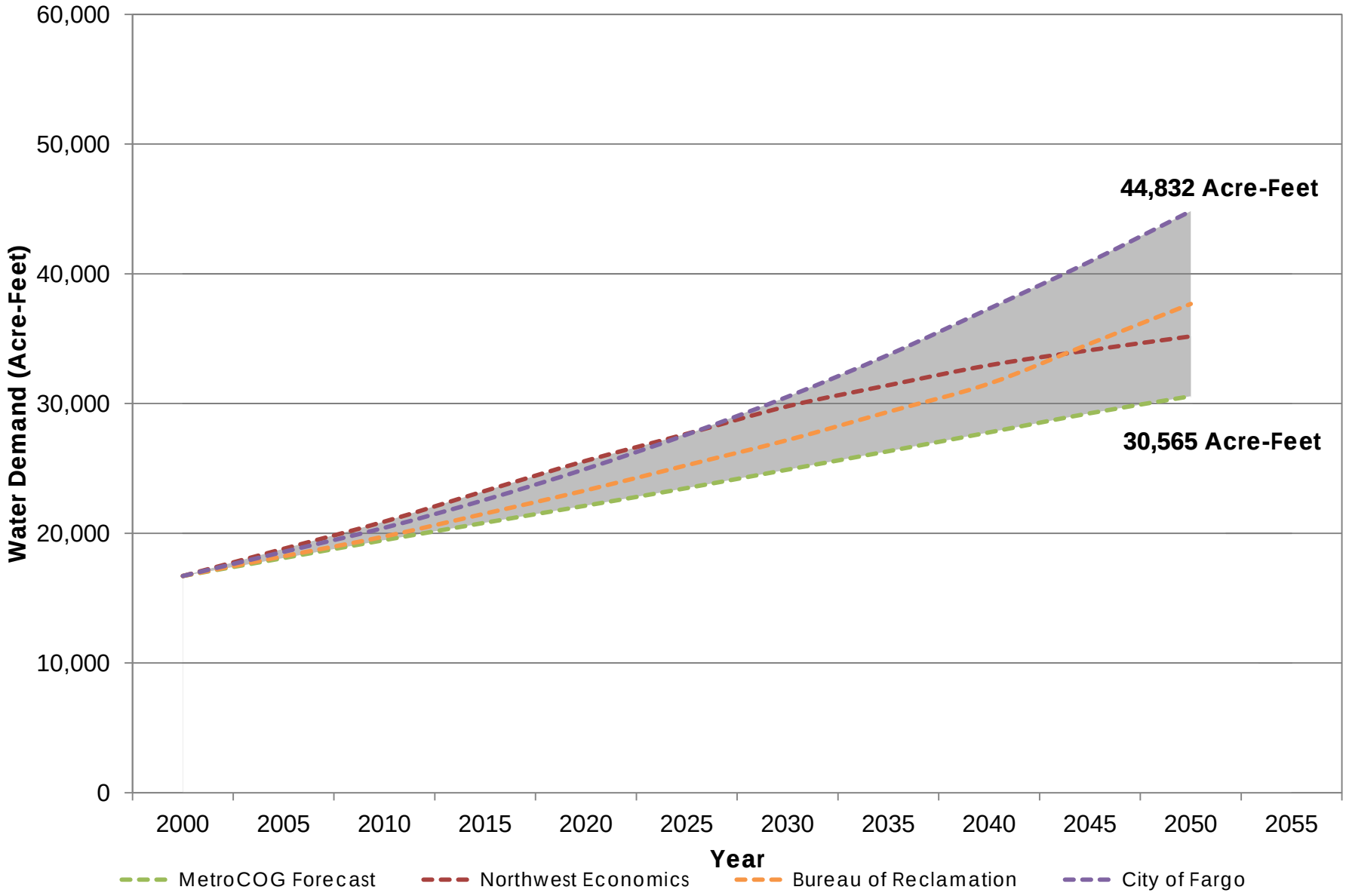
Major Water Users

- NDSU
- Sanford Health
- Cass Clay
- Essential Health
- Case New Holland

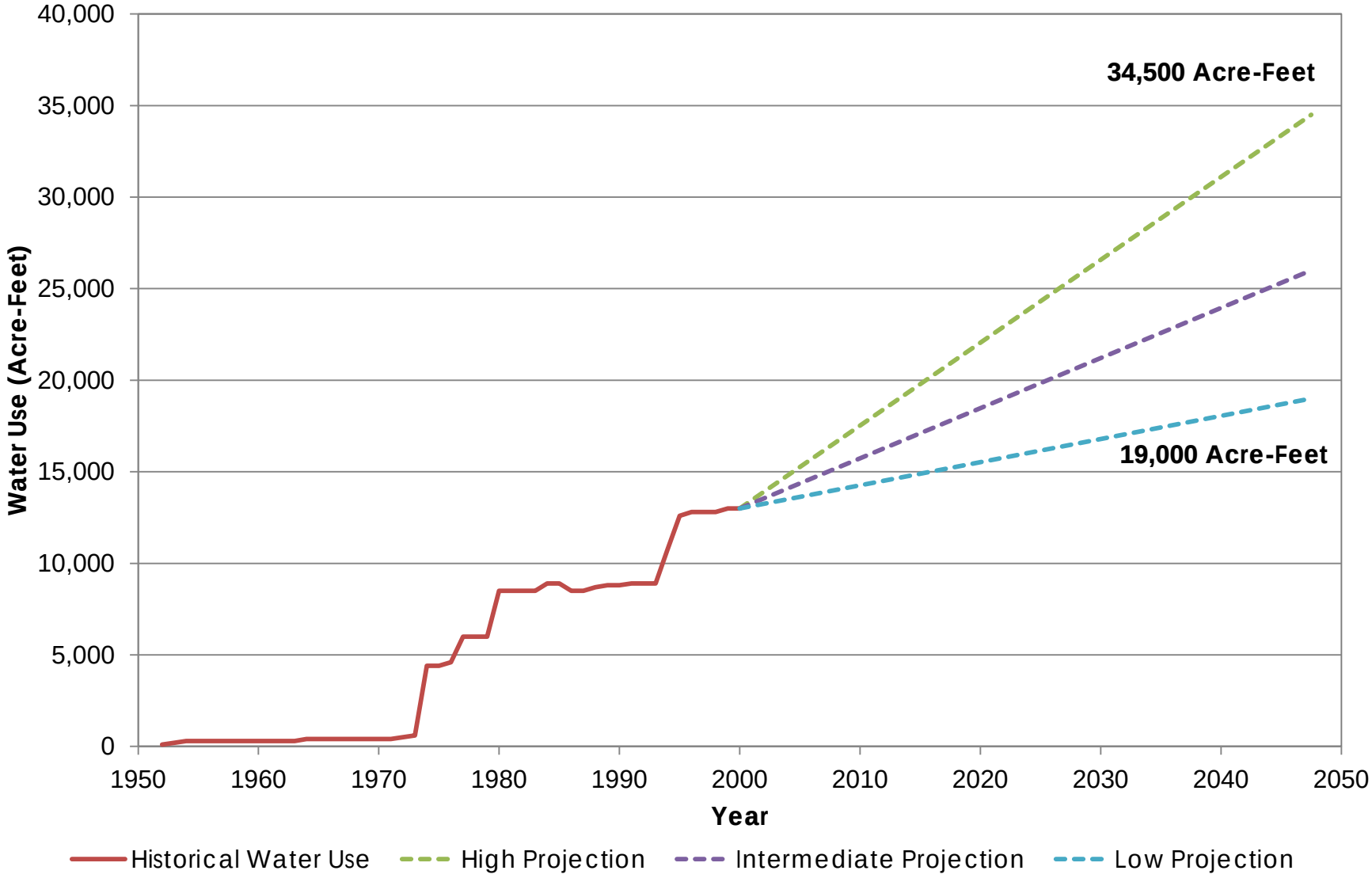
Fargo Population Projection Study Results



Water Demand Projections



Historical and Projected Industrial and Agricultural Water Use



NEAR-TERM DROUGHT CONSEQUENCES

If a 1930s type drought hit the Red River Valley today:

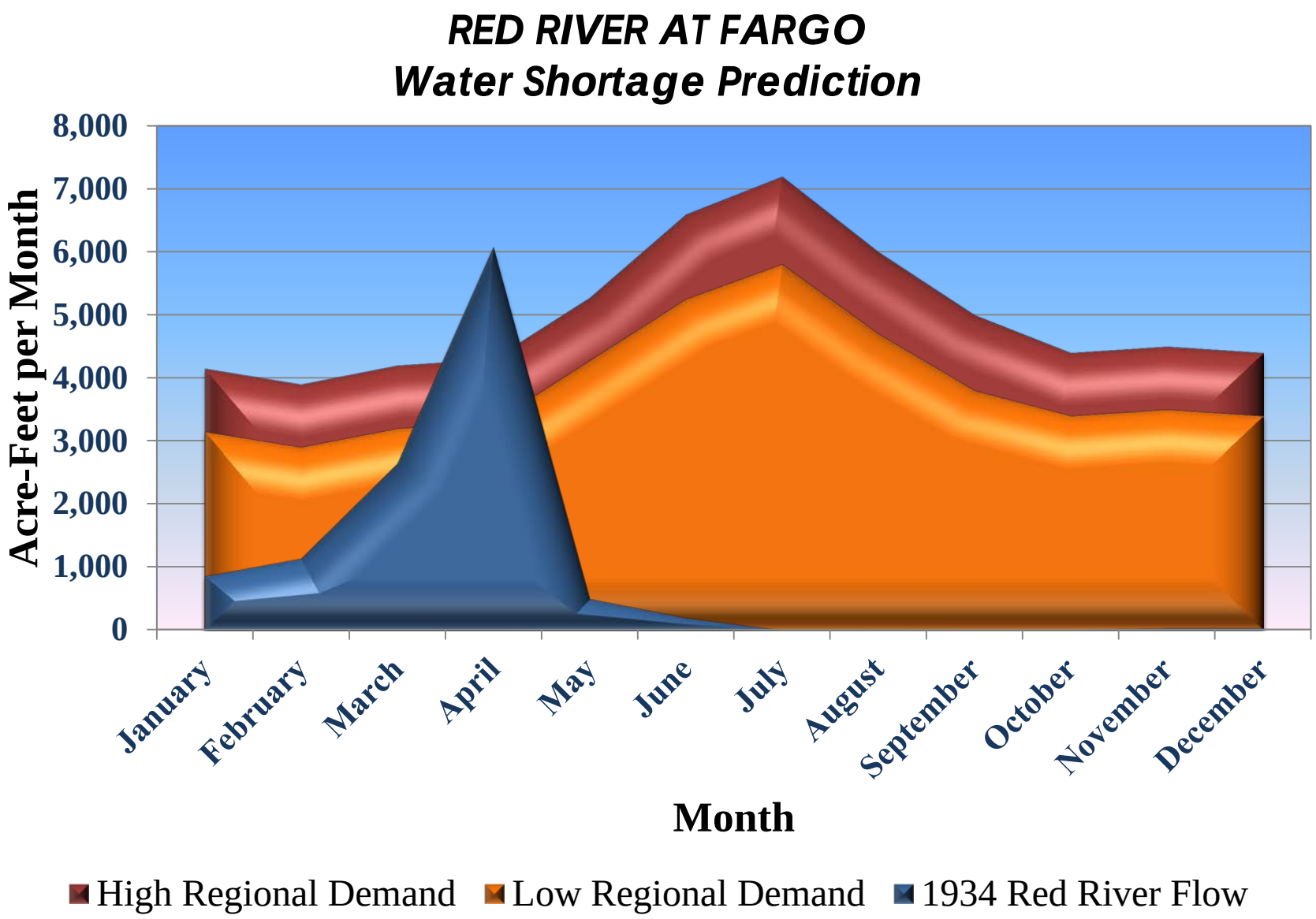
- Red River Valley would be short water every year of the 10 year drought
- Annual Municipal, Rural, & Industrial shortage would be 15% in the worst year
- Worst monthly shortage would be 45%

1934 FARGO DROUGHT IN THE FUTURE

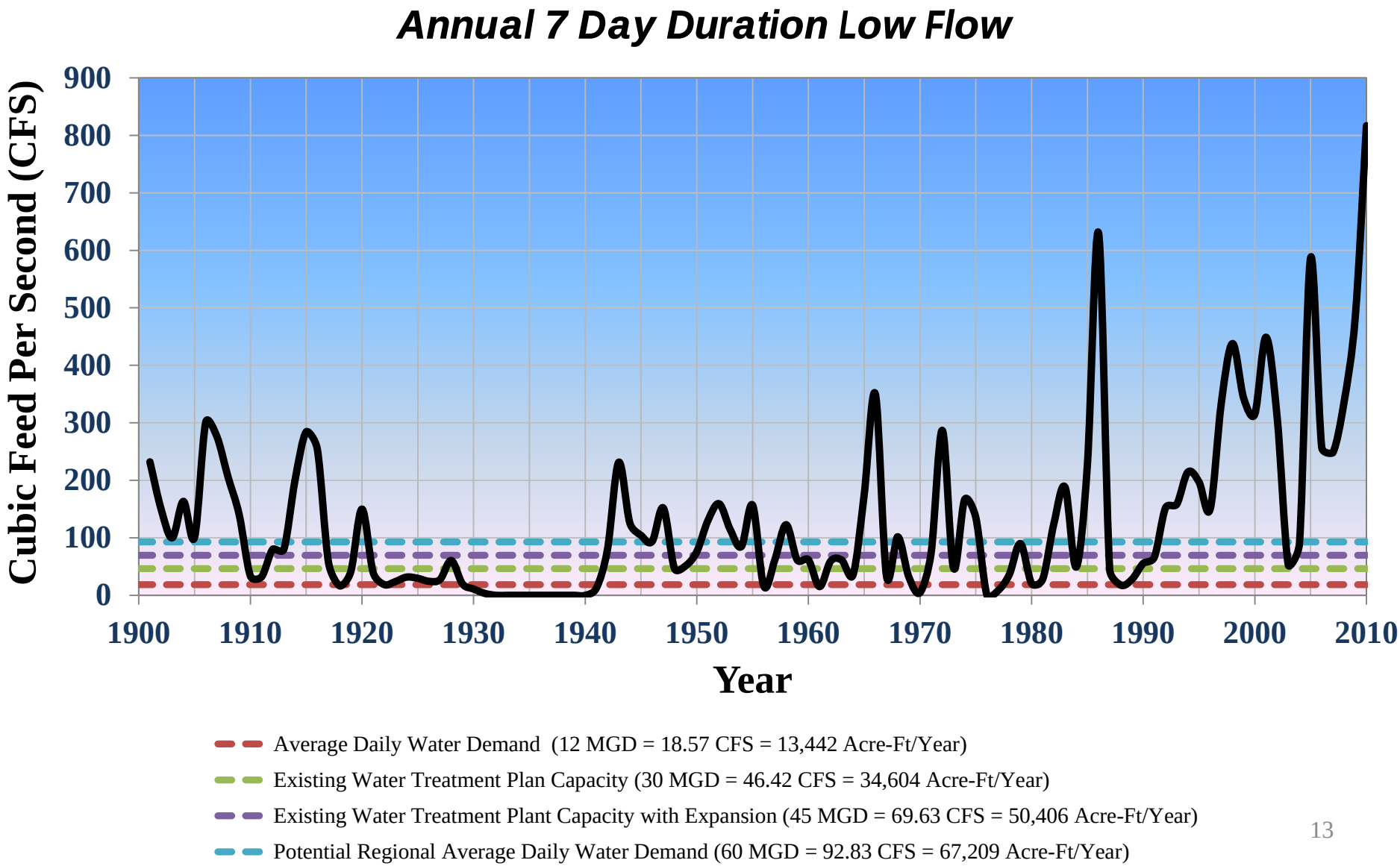
If a 1930s drought would occur in 2050:

- Annual Municipal, Rural, & Industrial shortage would be 41% in the worst year
- Worst monthly shortage would be 89%

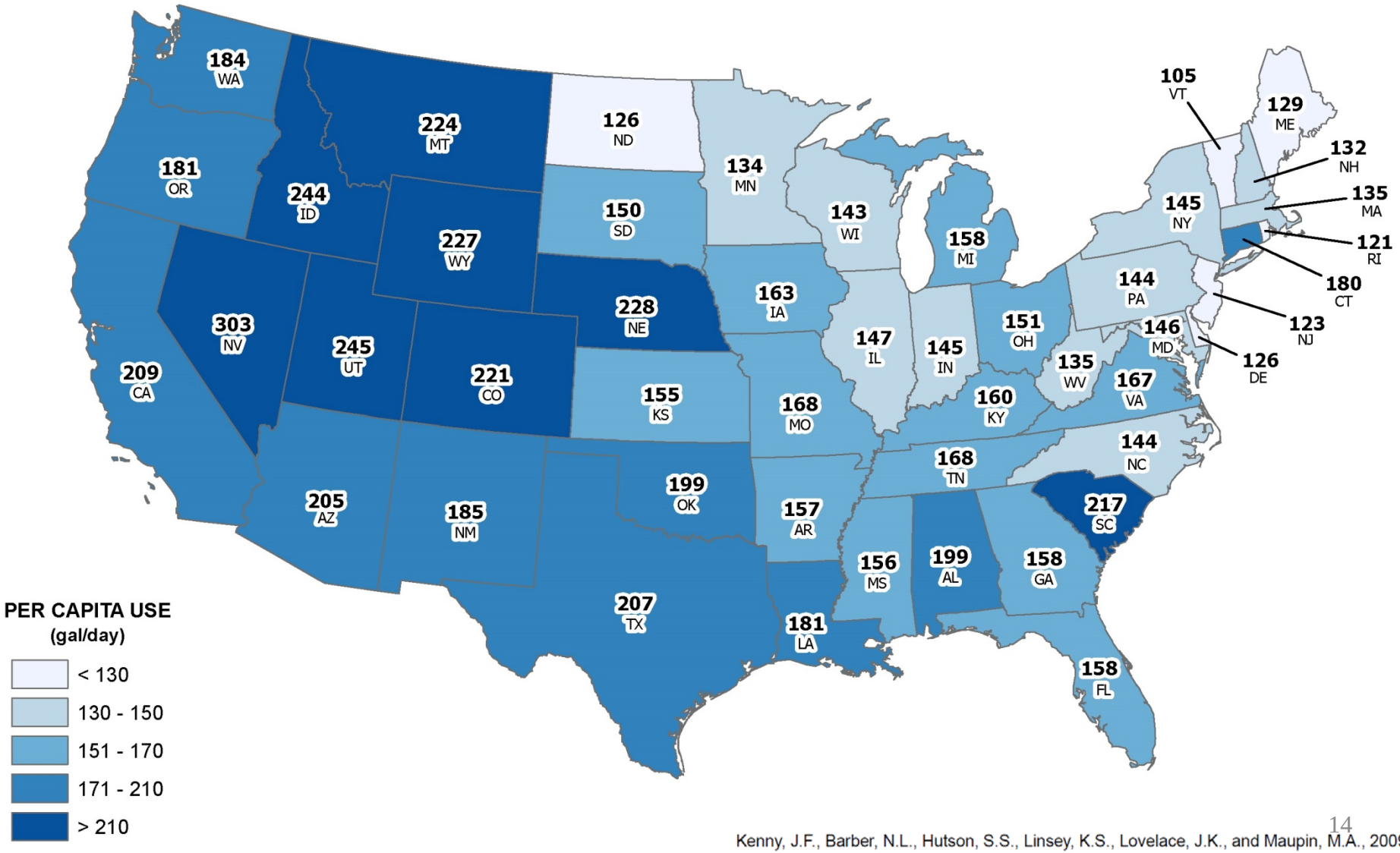
1934 FARGO WATER SHORTAGE COMPARISON



RED RIVER DROUGHT LIKELIHOOD AT FARGO



PUBLIC SUPPLY PER CAPITA WATER DEMANDS BY STATE (2005)



Kenny, J.F., Barber, N.L., Hutson, S.S., Linsey, K.S., Lovelace, J.K., and Maupin, M.A., 2009, Estimated use of water in the United States in 2005: U.S. Geological Survey Circular 1344, 52 p.