THE
ATMOSPHERIC RESERVOIR
Examining the Atmosphere and Atmospheric Resource Management

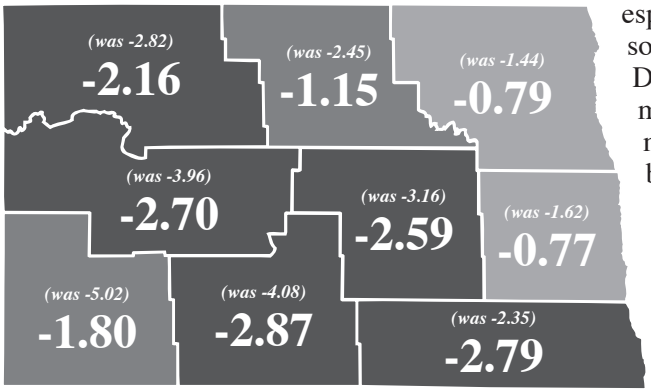
September rains ease drought

By Darin Langerud

Last month we explored the extent and severity of the drought that has gripped parts of North Dakota for much of the past two years. Drought conditions have been most severe over parts of southwest and south central North Dakota, but expanded to include most of the state by the end of August 2003. The Palmer Drought Index indicated extreme drought conditions for southwest and south central North Dakota, with severe to mild drought conditions over the rest of the state.

North Dakota
Weekly Palmer Drought Index
for the period ending September 27, 2003

-0.5 to -0.9 - Incipient Drought
-1.0 to -1.9 - Mild Drought
-2.0 to -2.9 - Moderate Drought
-3.0 to -3.9 - Severe Drought
-4.0 and below - Extreme Drought



The current drought has impacted North Dakota in many different ways. The most apparent effect has been on the agricultural sector, where crop production has been severely impacted the last two years. The agricultural economy is usually first to feel the effects of drought, as soil moisture conditions are most easily impacted by a lack of precipitation. If drought conditions persist long enough, additional impacts manifest themselves in the form of reduced streamflows, shrinking reservoirs, and water shortages. These impacts are being felt in North Dakota's two big reservoirs, Lake Sakakawea and Lake Oahe, but are more attributable to the protracted drought in Montana than the shorter more confined drought in our state.

Though drought took hold again this summer after decent moisture during spring, a bit of good news came in the form of widespread significant rainfall during the month of September. Numerous reports of two to four inches were reported, especially over the hardest-hit south and west. The Palmer Drought Index showed improvement in eight of North Dakota's nine regions, the only exception being the southeast. At the very least, many areas of the state will be in much better shape with respect to soil moisture heading into freeze-up. In this scenario, winter precipitation will be very important come spring. Current long-range forecasts suggest normal precipitation for the upcoming winter in North Dakota. Let's keep our fingers crossed for the white stuff.

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ARB awarded research grant

The Atmospheric Resource Board was recently awarded $99,984 through the Bureau of Reclamation's Weather Damage Modification Program (WDMP) to conduct cloud seeding research in North Dakota. This brings total WDMP funding in North Dakota to $292,000. The most recent award will fund numerical cloud modeling of the potential for hygroscopic cloud seeding in our state. If modeling results indicate sufficient potential, field trials will likely be the next step.

Hygroscopic seeding acts to increase the efficiency of rainfall production through the collision and coalescence of small droplets into raindrops. Glaciogenic seeding, the method currently used by the North Dakota Cloud Modification Project, works through an ice-phase process, improving the cloud's ability to effectively utilize supercooled liquid water. Recent research on hygroscopic seeding in other parts of the world has indicated its potential to increase rainfall from seeded clouds by 50 percent or more. In addition, hygroscopic seeding may act to significantly reduce the potential for thunderstorms to produce hail. If research indicates similar potential for hygroscopic seeding in North Dakota, we may see operational use of the technology here in the future.