

RED RIVER BASIN FLOODING

You don't have to live in the Red River Basin very long to learn that living here means learning to live with flooding. Flooding is caused by several factors—some are natural, some, man-made. Charlie Anderson, of JOR Engineering, works with several Watershed Districts in the Basin and has coauthored a Red River Basin Flood Damage Reduction Framework paper. He has summarized some of the information in that paper to help us better understand flood damage reduction strategies in the Basin.

Regardless of the cause, efforts to mitigate adverse flood effects have been attempted since settlement began here. Methods include structural solutions (e.g., reservoirs, levees) and nonstructural solutions (e.g., land-use planning, early warning systems). Measures range from field drainage to major storage reservoirs and may include land use change, channelization or levees. While each of these measures may be appropriate somewhere in the basin, none is a panacea.

Mitigation efforts have been driven primarily by local interest, often by individual landowners or groups of landowners. In fact, early water laws favored this approach. The theory perhaps was that eventually all the flood problems in the basin could thus be solved. Unfortunately, the easiest solutions at a local scale are often those that simply move the flood problem to other areas. The result has been a concentration of flood waters in downstream areas along the Red River mainstem and its major tributaries.

A more comprehensive strategy needs to be adopted, one that understands that flood mitigation efforts will have predictable impacts in other areas. Those impacts may be positive or negative, depending on what measures are chosen and where they are applied.

The effect of a given measure depends heavily on its location within the basin. More specifically, it depends on the timing of flows from that part of the basin relative to the flood period. Water from some areas, generally those closest to the river, tends to leave ahead of the flood crest. Holding back water from these areas by building in storage would be of little value in controlling downstream floods. Other areas, generally those farthest from the river, tend to add much of their runoff after the flood crest. Drainage or other measures that accelerate the delivery of water from those areas would tend to increase the amount of water during the flood crest.

These examples illustrate that certain flood mitigation strategies may have opposite downstream effects, depending on where they are carried out within the basin. This needs to be clearly understood and taken into account when water flow management decisions are made.

For better understanding, the basin can be divided into three zones representing relative timing of runoff: "early," "middle," and "late." The mainstem impacts of water management strategies have been summarized for each zone in a table developed by the

Minnesota Flood Damage Reduction Technical and Scientific Advisory Committee (TSAC) and published in TSAC's Technical Paper 11. You can refer to it, view the table and get a more complete explanation of strategies and their relative impacts at <http://www.rwmb.org/index.cfm> under the Red River Basin Flood Damage Reduction Work Group tab in the resources section.

Until the next Ripple Effect,

The Red River Basin Commission (RRBC)