

# Surface water runoff is a destructive force during heavy rainfall.

When roads, bridges, and culverts washed out across the Midwest, short-term emergency repairs cost taxpayers \$114 million in 2018-2019 alone.<sup>1</sup>

Bridge repair or replacement cost<sup>2</sup>  
**\$68,000 - \$184,000**

Road maintenance cost<sup>3</sup>  
(resurface 1/2 mile)  
**\$8,000 - \$50,000**

Culvert replacement cost<sup>4</sup>  
**\$5,200 - \$32,200**

  
Investment in well-managed pasture and hay can slow water down and prevent costly damage.

**Well-managed pasture and hay plants have well-developed root systems in the ground year-round.**

These root systems soak up more water than annual roots. Less surface water runoff means less erosion, flooding and damage during heavy rainfall.



**9 inches** of rainfall absorbed by soil under well-managed pasture and hay crops.<sup>5</sup>

Annual plants have less dense, seasonal roots.



**3 inches** of rainfall absorbed by soil under corn and soybean crops<sup>5</sup>

## Invest in Farmers

Farmers and landowners can create conditions that protect infrastructure.



Gene Schriefer

Erosion on a WI farm

Richard Cates

Lowery Creek, WI, adjacent to pasture and hay farms

“As many small dairy farms have gone out of business, the land has lost well-managed forage land. Roads bordered by well-managed crop and pasture land seldom need ditching. Roads bordered by crop land that is poorly managed often need maintenance after every heavy rain event.”

**JACK HERRICKS**

Jefferson Township Chairman, Monroe County, WI

**Learn more** about how productive, well-managed pasture and hay ground can protect infrastructure.

[www.greenlandsbluwaters.org](http://www.greenlandsbluwaters.org)



**Midwest Perennial Forage Working Group**

1 FHWA emergency highway repair allocations, 2018-2019. <https://www.fhwa.dot.gov/pressroom/fhwa1918.cfm>

2 Averages for IL, IA, MN, MO, WI; non-National Highway System bridges; 2017.

<https://www.fhwa.dot.gov/bridge/nbi/sd2017.cfm>

3 Average Annual Cost for Road Maintenance. USDA Forest Service.

[https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd528063.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd528063.pdf)

4 2015 Maintenance Culvert Cost Data Analysis. MN DOT.

<http://www.dot.state.mn.us/bridge/hydraulics/culvertcost/2015%20Drainage%20Maintenance%20Data%20Summary%20-%20Final%20Version.pdf>

5 Averages of measurements in June, August, and October/November. | L. Bharati, K.-H. Lee, T.M. Isenhardt, and R.C. Schultz. 2002. Soil-water infiltration under crops, pasture, and established riparian buffer in Midwestern USA. *Agroforestry Systems* 56:249-257.