

# WATER RESOURCES SCENARIOS FOR THE GREEN RIVER LOWLANDS PLANNING AREA

## Apocalypse Plow

### Extreme Climate Change + Passive Response<sup>1</sup>

Days ≥ 100° F and nights ≥ 70° F are normal during summer months. Precipitation significantly increases in the spring and winter. As average global temperatures rise sharply and quickly, climate change’s impacts are felt deeply on farms and in communities. Legal or regulatory mechanisms are not in place to address likely impacts. Consequences or realities include:

#### Economic

- Spring flooding significantly delays planting and leads to increased washouts, especially in Lee County, which has peat deposits at the surface
- Widespread erosion and higher temperatures lead to the loss of soil organic matter, rendering significant acreage unproductive for foraging and crops
- Staple crops such as corn and soybeans are far less productive
- Increased temperatures result in a longer growing season
- Irrigation use increases dramatically in rural and urbanized areas
- Drought and flooding limit recreation-based economic development

#### Environmental

- Algal blooms are common, including in freshwater lakes and rivers
- Flash or short-term drought events occur yearly, often in the same year with flooding
- New invasive species create public health, agricultural, and ecosystem challenges
- Trees are strained, and the canopies they create in municipalities are diminished
- Draining the aquifer during summers causes [cementation](#)<sup>2</sup>, reducing aquifer size over time

#### Social

- In all four counties, water use exceeds supply in the summer
- Urban flooding (i.e., flooding not related to a river) occurs yearly throughout municipalities
- There is little coordination with respect to field tile installation; downstream impacts are not considered
- Incidents of drinking water contamination in public systems and private wells increase
- There are no restrictions on domestic water use for lawns and private gardens
- Industry and agriculture do not report on or regulate water use; research institutions are limited to reactive reporting
- No long-term engagement on issues or communications between stakeholders

## Risky Agribusiness

### Mild Climate Change + Passive Response

Days ≥ 100° F and nights ≥ 70° F are atypical during summer months. As average global temperatures rise gradually and slowly (or stabilize), climate change and its impacts are not felt deeply on farms and in communities. Legal or regulatory mechanisms are not in place to address potential impacts. Consequences or realities include:

#### Economic

- Spring flooding occasionally delays planting
- Localized erosion and higher temperatures somewhat decrease soil organic matter, reducing forage and crop quality
- Staple crops such as corn and soybeans are less productive
- Irrigation use may increase in rural and urbanized areas
- Drought and flooding may limit recreation-based economic development

#### Environmental

- Algal blooms occur but are less destructive
- New invasive species create public health, agricultural, and ecosystem challenges
- Longer growing seasons result in crops using more water over time and reduces the Tampico Aquifer’s recharge time, which currently only occurs early October to mid-February
- Native trees are strained, but canopies remain relatively healthy

#### Social

- In Bureau and Whiteside counties, water use exceeds supply in the summer
- Urban flooding occurs in areas already prone to flooding
- There is little coordination with respect to field tile installation; downstream impacts are not considered
- Incidents of drinking water contamination in public systems and private wells increase
- There are no restrictions on domestic water use for lawns and private gardens
- Industry and agriculture do not report on or regulate water use; research institutions are limited to reactive reporting
- No long-term engagement on issues or communications between stakeholders

<sup>1</sup> Whether public, private, or not-for-profit-based

<sup>2</sup> The diagenetic process by which coarse clastic sediments become lithified or consolidated into hard, compact rocks, usually through deposition or precipitation of minerals in the spaces among the individual grains of the sediment. Source: Definition of cementation. (2022). *Mindat.org*. Retrieved 29 August, 2022, from <https://www.mindat.org/glossary/cementation>

# WATER RESOURCES SCENARIOS FOR THE GREEN RIVER LOWLANDS PLANNING AREA

## How Not to Drain Your Flagon

### Extreme Climate Change + Active Response

Days  $\geq 100^{\circ}$  F and nights  $\geq 70^{\circ}$  F are normal during summer months. Precipitation significantly increases in the spring and winter. As average global temperatures rise sharply and quickly, climate change’s impacts are felt deeply on farms and in communities. Legal or regulatory mechanisms exist to address likely impacts. Consequences or realities include:

#### Economic

- Spring flooding significantly delays planting and leads to increased washouts, especially in Lee County, which has peat deposits at the surface
- Widespread erosion and higher temperatures lead to the loss of soil organic matter, rendering significant acreage unproductive for foraging and crops
- Staple crops such as corn and soybeans are far less productive
- Increased temperatures result in a longer growing season
- Irrigation use increases, but water use is reported; public funding is allocated towards data collection, auditing, and distribution, allowing researchers to release proactive reports
- Drought and flooding limit recreation-based economic development

#### Environmental

- Algal blooms occur but are less destructive; nutrient use and runoff are monitored in streams and other water bodies
- Flash or short-term drought events occur yearly, often in the same year with flooding
- New invasive species create public health, agricultural, and ecosystem challenges; some management occurs through control methods
- Trees canopies are diminished; municipal ordinances address upkeep and planting
- Aquifer overdraw happen but impacts are measured

#### Social

- In all four counties, water demand may exceed supply in the summer
- Urban flooding occurs in areas already prone to flooding
- Field tile installation impacts are considered and modeled when possible; permitting is required
- Significant water restrictions are implemented for industrial and domestic use during the summer
- Incidents of drinking water contamination in public systems and private wells increase; localities are required to treat for additional contaminants
- Fruitful and regular engagement between stakeholders

## Greenfinger

### Mild Climate Change + Active Response

Days  $\geq 100^{\circ}$  F and nights  $\geq 70^{\circ}$  F are atypical during summer months. As average global temperatures rise gradually and slowly (or stabilize), climate change and its impacts are not felt deeply on farms and in communities. Legal or regulatory mechanisms exist to address potential impacts. Consequences or realities include:

#### Economic

- Spring flooding occasionally delays planting
- Localized erosion and higher temperatures somewhat decrease soil organic matter, reducing forage and crop quality
- Staple crops such as corn and soybeans are less productive
- Irrigation use is moderate in rural and urbanized areas, and agricultural producers are required to report water used for irrigation; public funding is allocated towards data collection, auditing, and distribution, allowing researchers to release proactive reports
- Recreation-based economic development dependent on water use is relatively stable

#### Environmental

- Algal blooms are less common; nutrient use and runoff are monitored in streams and other water bodies
- Flash or short-term drought events may occur yearly; occasionally, flooding may occur in the same year
- New invasive species create public health, agricultural, and ecosystem challenges but are managed through control methods
- Trees are strained, but municipal tree canopies remain relatively healthy; municipal ordinances address upkeep and planting
- Aquifer overdraw is eliminated

#### Social

- In Bureau and Whiteside counties, water demand may exceed supply in the summer
- Urban flooding is less expansive
- Field tile installation impacts are considered and modeled when possible; permitting is required
- Some water restrictions are implemented for industrial and domestic use during drought conditions
- Incidents of drinking water contamination in public systems and private wells are present but not widespread; localities are required to treat for additional contaminants
- Fruitful and regular engagement between stakeholders

#### Data Sources:

- Abrams, D. B., Zhenxing, Z., Iordache, V., Kelly, W.R., Krasowski, M.P., Mannix, D.H., Healy, C., Wu, X., and Cullen, C., (n.d.): DRAFT - Water Supply Planning: Assessment of Water Resources for Water Supply in the Rock River Region. Illinois State Water Survey, <https://www.blackhawkhills.com/naturalresources>
- Wuebbles, D., J. Angel, K. Petersen, and A.M. Lemke (Eds.), 2021: An Assessment of the Impacts of Climate Change in Illinois. The Nature Conservancy, Illinois, [https://doi.org/10.13012/B2IDB-1260194\\_V1](https://doi.org/10.13012/B2IDB-1260194_V1).