**State of Illinois**
**Bruce Rauner, Governor**

**Illinois Environmental Protection Agency**
**Alec Messina, Director**

# TMDL Development for Projects within the Kaskaskia River Watershed

## Background

Over the last 30 years, waters in Illinois have been monitored for chemical, biological and physical conditions. In some cases, the conditions of those rivers and lakes fall short of the need to support basic water quality use goals. These waters are deemed impaired since they cannot meet use expectations set for them under state and federal law. When this happens Total Maximum Daily Load (TMDL) reports are developed for impaired waters to determine the maximum amount of a pollutant a water body can receive and still meet water quality standards and support its designated uses. Designated uses include aquatic life, public water supply, swimming, recreation, fish consumption, and aesthetic quality.

TMDLs are done in stages to allow for public involvement and input. TMDL development in Illinois begins with the collection data—water quality, point source discharge, precipitation, soils, geology, topography, and land use—within the specific watershed. All impaired water body segments within the watershed are identified, along with potential pollutants causing the impairment. Illinois EPA determines the tools necessary to develop the TMDL. In most cases, computer models are used to simulate natural settings and calculate pollutant loads. Along with data analysis, model recommendations are made in the first stage of the TMDL. This information is presented at the first public meeting.

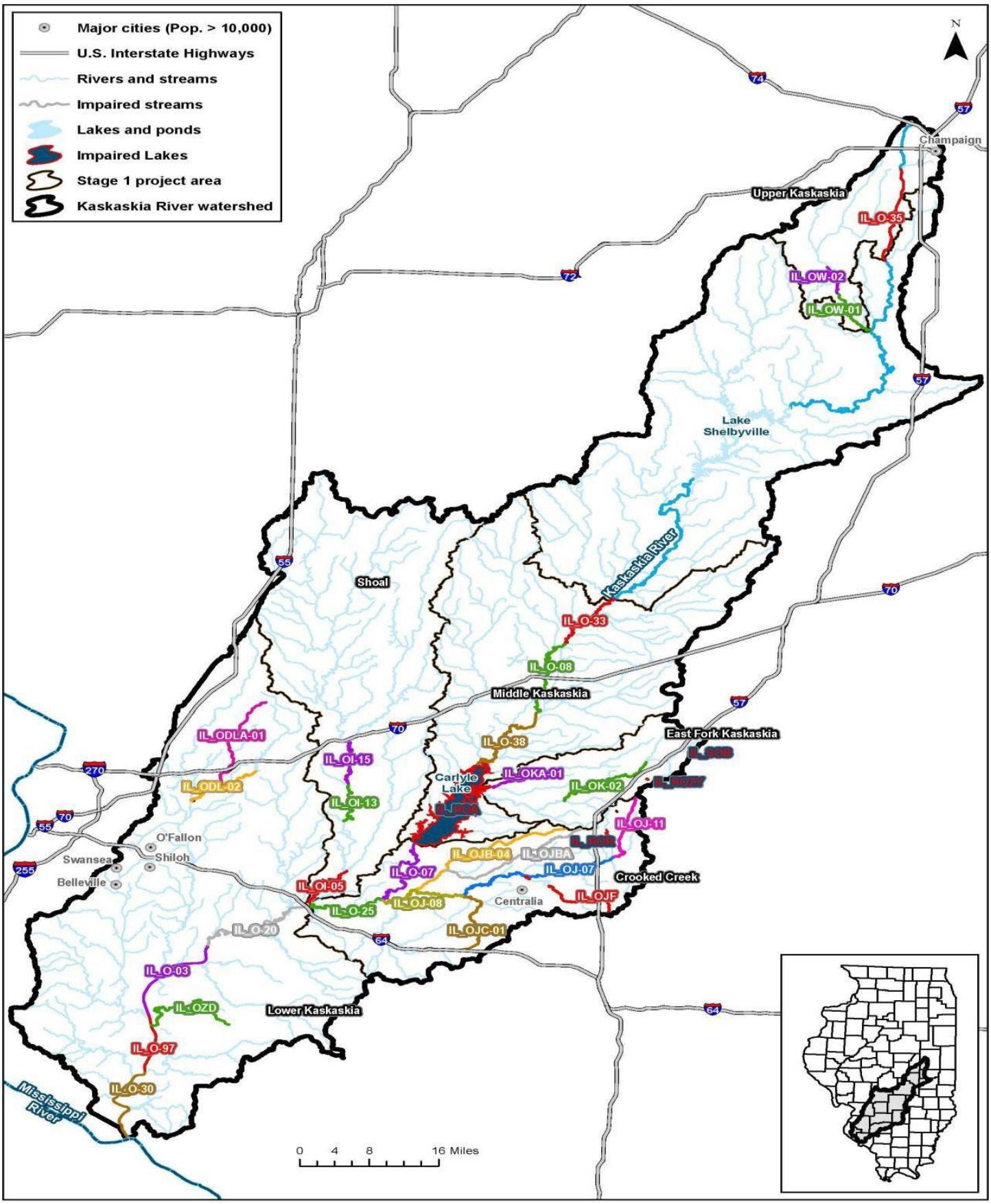
The appropriate model or models are selected based on the pollutants of concern, the amount of data available and the type of water body. In some cases, additional data needs to be collected before continuing. The model is used to determine how much a pollutant needs to be reduced in order for the water to be meeting its designated uses.

An implementation plan is developed for the watershed spelling out the actions necessary to achieve the goals. The plan can specify limits for point source dischargers and recommend best management practices (BMPs) for nonpoint sources. Another public meeting is held to discuss this plan and to involve the local community. Commitment to the implementation plan by the citizens who live and work in the watershed is essential to success in reducing the pollutant loads and improving water quality.

TMDL watershed projects within the Kaskaskia River Watershed include:

- Upper Kaskaskia River/Lake Fork Watershed
- Middle Kaskaskia/Carlyle Lake Watershed
- East Fork Kaskaskia River/Farina Lake Watershed
- Crooked Creek/Lost Creek Watershed
- Shoal Creek II Watershed
- Lower Kaskaskia River/Doza Creek Watershed

## Kaskaskia River Watershed Map



# Upper Kaskaskia River/Lake Fork Watershed

## Waterbody Designated Uses and Impairments

| Waterbody | Segment ID | Designated Use | Impairment(s) |
|---|---|---|---|
| Kaskaskia River | IL_O-35 | Aquatic Life | Dissolved Oxygen, pH[1] |
| Lake Fork | IL_OW-01 | Aquatic Life | Chloride, Dissolved Oxygen |
| Lake Fork | IL_OW-02 | Aquatic Life | Chloride, Dissolved Oxygen |

[1] Based on evaluation of the last ten years of available data (2007–2016), it was determined that Kaskaskia River segment IL_O-35 is not impaired for pH

## Watershed Information

The Upper Kaskaskia River and Lake Fork watershed is located in central Illinois. The headwaters begin near Champaign, IL. Lake Fork joins the Upper Kaskaskia river upstream of Shelbyville Lake and the Kaskaskia River eventually joins the Mississippi River south of St. Louis, Missouri. The watershed covers land within Piatt, Moultrie, Douglas, and Champaign Counties.

Cultivated crops make up the majority of the land cover in the project area. Developed areas are also present surrounding Champaign, Atwood and Bement.

## Potential Pollutant Sources

There are seven point source discharges (municipal and industrial wastewater treatment plants) in this watershed. Potential nonpoint sources include: channelization, crop production, stormwater and agricultural runoff, septic systems, animal agriculture activities, and unknown sources.

# Middle Kaskaskia/Carlyle Lake Watershed

## Waterbody Designated Uses and Impairments

| Waterbody | Segment ID | Designated Use | Impairment(s) |
|---|---|---|---|
| Kaskaskia River | IL_O-08 | Primary Contact Recreation | Fecal Coliform |
| Kaskaskia River | IL_O-08 | Public and Food Processing Water Supply | Atrazine[1] |
| Kaskaskia River | IL_O-33 | Aquatic Life | Dissolved Oxygen, Temperature[2] |
| Kaskaskia River | IL_O-38 | Primary Contact Recreation | Fecal Coliform |
| Carlyle Lake | IL_ROA | Aesthetic Quality | Phosphorus (Total),<br>Total Suspended Solids (TSS)[2] |

[1] Impairment was removed from the 2018 draft 303(d) list and is not addressed further in this report.
[2] These causes of impairment are not being addressed as part of this project.

## Watershed Information

The Middle Kaskaskia River watershed is located in central Illinois. The headwaters for the watershed begin north of Vandalia City, IL. The Kaskaskia River then flows through Carlyle Lake at the downstream end of the watershed. The watershed covers 946 square miles; major tributaries of the river include Big Creek, Ramsey Creek, Hickory Creek, and Hurricane Creek. The watershed covers land within Bond, Christian, Clinton, Effingham, Fayette, Marion, and Shelby Counties.

Land use in the watershed is heavily influenced by agriculture. Urban area is located near the city of Vandalia and several small towns in the watershed. Land use in the watershed includes agriculture – cultivated crops and pasture/hay (approximately 63 percent), forest (approximately 24 percent), and urban (approximately 8 percent). Corn and soybeans are the most common crops, with much smaller areas of spring wheat, alfalfa and other crops.

### Potential Pollutant Sources

There are 15 point source discharges (municipal and industrial wastewater treatment and public water supply facilities), three municipal separate storm sewer systems (MS4s), and one confined animal feeding operation (CAFO) in this watershed. Potential nonpoint sources include: littoral/shore area modifications, other recreational pollution sources, crop production, animal agriculture, septic systems, wildlife, stormwater and agricultural runoff, stream channel and shoreline erosion, internal loading, and unknown sources.

## East Fork Kaskaskia River/Farina Lake Watershed

### Waterbody Designated Uses and Impairments

| Waterbody | Segment ID | Designated Use | Impairment(s) |
|---|---|---|---|
| East Fork Kaskaskia River | IL_OK-02 | Aquatic Life | Dissolved Oxygen, Phosphorus (Total)[1] |
| North Fork Kaskaskia River | IL_OKA-01 | Aquatic Life | Atrazine, Terbufos, Phosphorus (Total)[1] |
| Kinmundy Old Lake | IL_ROZY | Aesthetic Quality | Phosphorus (Total) |
| Farina Lake | IL_SOB | Aquatic Life | Copper[2], Dissolved Oxygen, pH, Terbufos |

[1] These causes of impairment are not being addressed as part of this project.
[2] Based on evaluation of the last ten years of available data (2007-2016), it was determined that Farina Lake (IL_SOB) is not impaired for copper

### Watershed Information

The East Fork Kaskaskia Farina Lake watershed is located in central Illinois. The headwaters begin in Fayette and Marion counties. East Fork Kaskaskia flows west until its confluence with the Kaskaskia River at Carlyle Lake. The Kaskaskia River eventually joins the Mississippi River south of St. Louis, Missouri. The watershed covers land within Clinton, Fayette and Marion Counties.

The majority of land cover in the watershed is agricultural. Primary crops are corn, soybeans, and wheat. The two major communities in this watershed are Patoka and Vernon.

### Potential Pollutant Sources

There are seven point source discharges (municipal and industrial wastewater treatment plants), and one municipal separate storm sewer systems (MS4s) in this watershed. Potential nonpoint sources include: crop production, agriculture, pesticide application, stormwater and agricultural runoff, septic systems, animal agriculture, internal loading, and unknown sources.

## Crooked Creek/Lost Creek Watershed

### Waterbody Designated Uses and Impairments

| Waterbody | Segment ID | Designated Use | Impairment(s) |
|---|---|---|---|
| Kaskaskia River | IL_O-07 | Aquatic Life | Dissolved Oxygen, Phosphorus (Total)[1] |
| Kaskaskia River | IL_O-25 | Aquatic Life | Dissolved Oxygen |

| | | | |
|---|---|---|---|
| Kaskaskia River | IL_O-25 | Public and Food Processing Water Supply | Simazine |
| Crooked Creek | IL_OJ-07 | Aquatic Life | Dissolved Oxygen, Phosphorus (Total)[1] |
| Crooked Creek | IL_OJ-08 | Aquatic Life | Iron[2], Phosphorus (Total)[1], Total Suspended Solids (TSS)[1] |
| Crooked Creek | IL_OJ-11 | Aquatic Life | Dissolved Oxygen |
| Lost Creek | IL_OJB-04 | Aquatic Life | Dissolved Oxygen, Phosphorus (Total)[1], Sedimentation/Siltation[1] |
| Prairie Creek | IL_OJBA | Aquatic Life | Dissolved Oxygen, Phosphorus (Total)[1] |
| Grand Point Creek | IL_OJC-01 | Aquatic Life | Dissolved Oxygen, Sedimentation/Siltation[1] |
| Raccoon Creek | IL_OJF | Aquatic Life | Dissolved Oxygen |
| Salem Lake | IL_ROR | Aquatic Life | pH, Total Suspended Solids (TSS)[1] |
| Salem Lake | IL_ROR | Public and Food Processing Water Supply | Simazine |

[1] These causes of impairment are not being addressed as part of this project.
[2] Based on evaluation of the last ten years of available iron data (2007–2016), it was determined that segment IL_OJ-08 does not need an iron TMDL

### Watershed Information

The Crooked Creek watershed is located in southern Illinois; the headwaters begin just north of the city of Salem, IL. Crooked Creek joins the Kaskaskia river upstream of Shelbyville Lake, and the Kaskaskia River eventually joins the Mississippi River south of St. Louis, Missouri. The watershed covers land within Clinton, Jefferson, Marion, and Washington Counties.

Land use in the watershed is heavily influenced by agriculture. Cities in the watershed include Centralia, Salem, Nashville, and Carlyle. Land use in the watershed includes cultivated crops, pasture/hay, forest, and urban. Corn and soybeans are the most common crops.

### Potential Pollutant Sources

There are 19 point source discharges (municipal and industrial wastewater treatment plants), and one confined animal feeding operation (CAFO) in this watershed. Potential nonpoint sources include: crop production, agriculture, loss of riparian habitat, streambank modifications/destabilization, impacts from hydrostructure flow regulation/modification, pesticide application, stormwater and agricultural runoff, septic systems, animal agriculture, internal loading, and unknown sources.

## Shoal Creek II Watershed

### Waterbody Designated Uses and Impairments

| Waterbody | Segment ID | Designated Use | Impairment(s) |
|---|---|---|---|
| Shoal Creek | IL_OI-05 | Aquatic Life | Dissolved Oxygen |
| Shoal Creek | IL_OI-08 | Public and Food Processing Water Supply | Iron[1] |
| Shoal Creek | IL_OI-13 | Aquatic Life | Dissolved Oxygen |
| Shoal Creek | IL_OI-15 | Aquatic Life | Dissolved Oxygen |

[1] Impairment was removed from the 2018 draft 303(d) list and is not addressed further in this report

### Watershed Information

The Shoal Creek watershed is located in southwestern Illinois. The headwaters begin in northern Montgomery County and Christian County, IL and flow south towards its confluence with the Kaskaskia River. Shoal Creek joins the Upper Kaskaskia River downstream of Carlyle Lake and the Kaskaskia River eventually joins the Mississippi River south of St. Louis, Missouri. The watershed covers land within Bond, Clinton, Macoupin, Madison, and Montgomery Counties.

Cultivated crops make up the majority of the land cover in the project area. The city of Breese is the largest population center in the project area.

### Potential Pollutant Sources

There are four point source discharges (municipal wastewater treatment plants), and one confined animal feeding operation (CAFO) in this watershed. Potential nonpoint sources include: crop production, agriculture, loss of riparian habitat, agricultural runoff, septic systems, animal agriculture.

## Lower Kaskaskia River/Doza Creek Watershed

### Waterbody Designated Uses and Impairments

| Waterbody | Segment ID | Designated Use | Impairment(s) |
|---|---|---|---|
| Kaskaskia River | IL_O-03 | Aquatic Life | Dissolved Oxygen, Sedimentation/Siltation[1] |
| Kaskaskia River | IL_O-20 | Aquatic Life | Phosphorus (Total)[1], Total Suspended Solids (TSS)[1], Temperature[1] |
| Kaskaskia River | IL_O-20 | Public and Food Processing Water Supply | Iron |
| Kaskaskia River | IL_O-30 | Aquatic Life | Iron, Phosphorus (Total)[1], Sedimentation/Siltation, Total Suspended Solids (TSS)[1], Temperature[1] |
| Kaskaskia River | IL_O-30 | Public and Food Processing Water Supply | Iron[2] |
| Kaskaskia River | IL_O-97 | Aquatic Life | Dissolved Oxygen[2], Sedimentation/Siltation[1] |
| East Fork Silver Creek | IL_ODL-02 | Aquatic Life | Dissolved Oxygen |
| Sugar Fork | IL_ODLA-01 | Aquatic Life | Dissolved Oxygen, Manganese[3] |
| Doza Creek | IL_OZD | Aquatic Life | Dissolved Oxygen, Manganese[3], Phosphorus (Total)[1], Sedimentation/Siltation[1], Sludge[1] |
| Highland Silver Lake | IL_ROZA | Aquatic Life | pH |

[1] These causes of impairment are not being addressed as part of this project.
[2] Based on evaluation of the last ten years of available data (2007–2016), it was determined that these segment(s) are not impaired. No TMDLs are provided for these causes of impairment.
[3] Additional data are needed to verify impairment.
[4] Impairment was removed from the 2018 draft 303(d) list and is not addressed further in this report.

### Watershed Information

The Lower Kaskaskia River watershed is located in southwestern Illinois. The watershed begins at the confluence of the Kaskaskia River and Shoal Creek and ends where the Kaskaskia River joins the Mississippi River south of St. Louis, Missouri. The project area is located in Bond, Clinton, Macoupin, Madison, Monroe, Montgomery, Perry, Randolph, St. Clair, and Washington counties. The city of St. Louis urban area intersects the western boundary of the watershed.

Cultivated crops make up the majority of the land cover in the Lower Kaskaskia River watershed. There are several small cities in the watershed, with the majority of development located in the city of St. Louis urban area.

## Potential Pollutant Sources

There are 65 point source discharges (municipal and industrial wastewater treatment and public water supply facilities), 24 municipal separate storm sewer systems (MS4s), and five confined animal feeding operations (CAFOs) in this watershed. Potential nonpoint sources include: channelization, dredging, drainage/filling/loss of wetlands, loss of riparian habitat, impact from abandoned mine lands, petroleum/natural gas activities, municipal point source discharges, crop production, agriculture, stream channel and shoreline erosion, stormwater and agricultural runoff, septic systems, animal agriculture, and unknown sources.

For more information on this specific TMDL or the TMDL program, visit the Illinois EPA website at https://www2.illinois.gov/epa/topics/water-quality/watershed-management/tmdls/Pages/default.aspx

For information on the assessment of Illinois waters, refer to the Integrated Report and 303(d) List at https://www2.illinois.gov/epa/topics/water-quality/watershed-management/resource-assessments/Pages/default.aspx

If you have any questions, please contact the project manager, Allison Ristau (Planning Unit) at 217-782-3362 or at Allison.Ristau@illinois.gov or Abel Haile by phone at 217/782-3362 or at Abel.Haile@illinois.gov.

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