

Surface Water Availability in Kane County

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What Factors Most Affect Low Flows and Surface Water Availability for Kane County?

- Water use withdrawals
- Effluent discharges
- Dam operation
- Climate variability
- Land use/urbanization

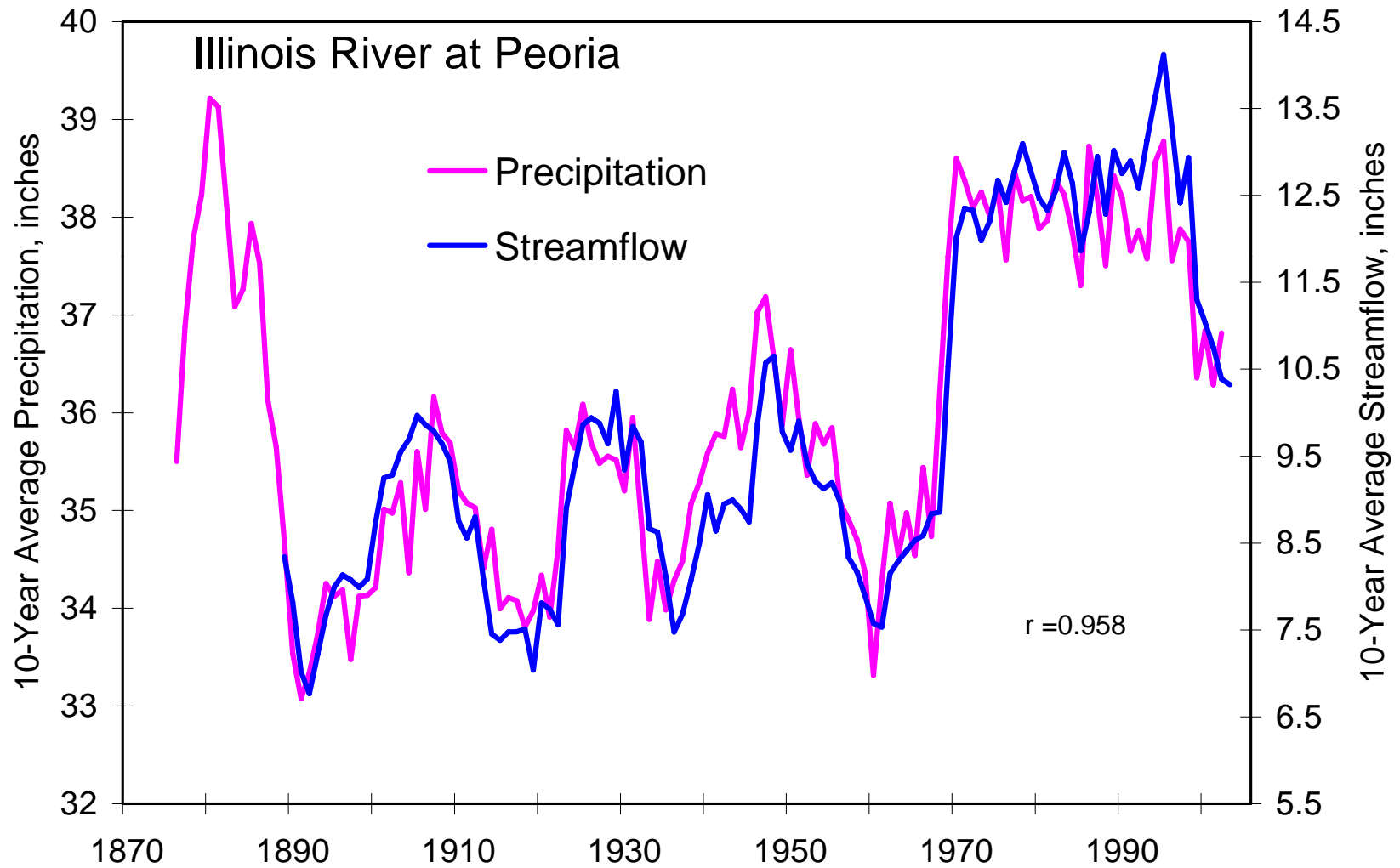


Factors Affecting Kane County Low Flows and Surface Water Availability

1. Climate variability and Effluent discharges (tied)
3. Stratton Dam operation
4. Water use withdrawals
Land use/urbanization**
Groundwater use effects on baseflow**

** Variable local effects that are often difficult to detect and predict

Climate Variations and An Uncertain Future





Fox River Low Flows: Upstream Factors

Stratton Dam (Chain of Lakes) operation policy:

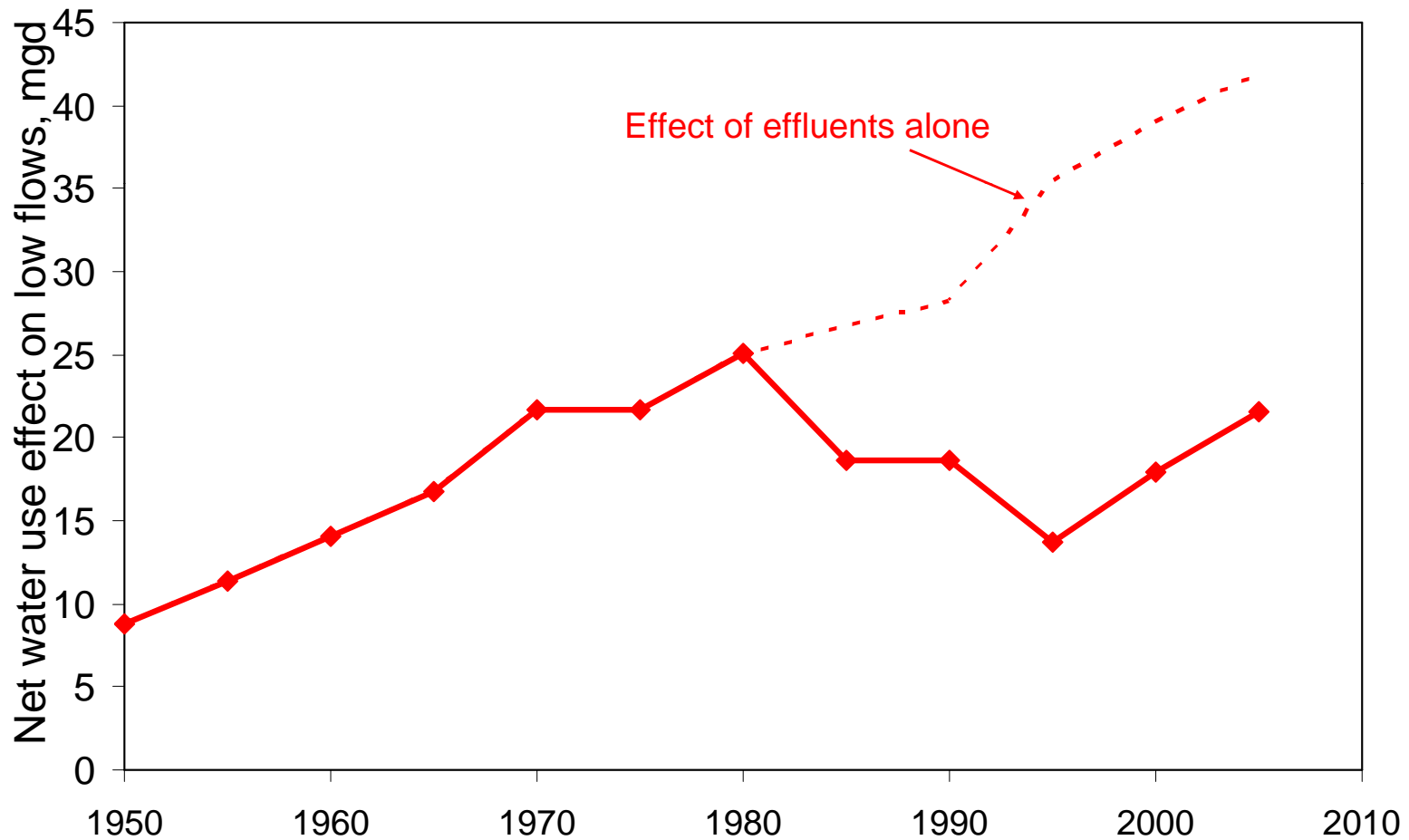
- Changes in summer pool level and minimum releases have increased low flows since 1960s
- Additional changes unlikely in near future

Effluents from Waukesha, Wisconsin:

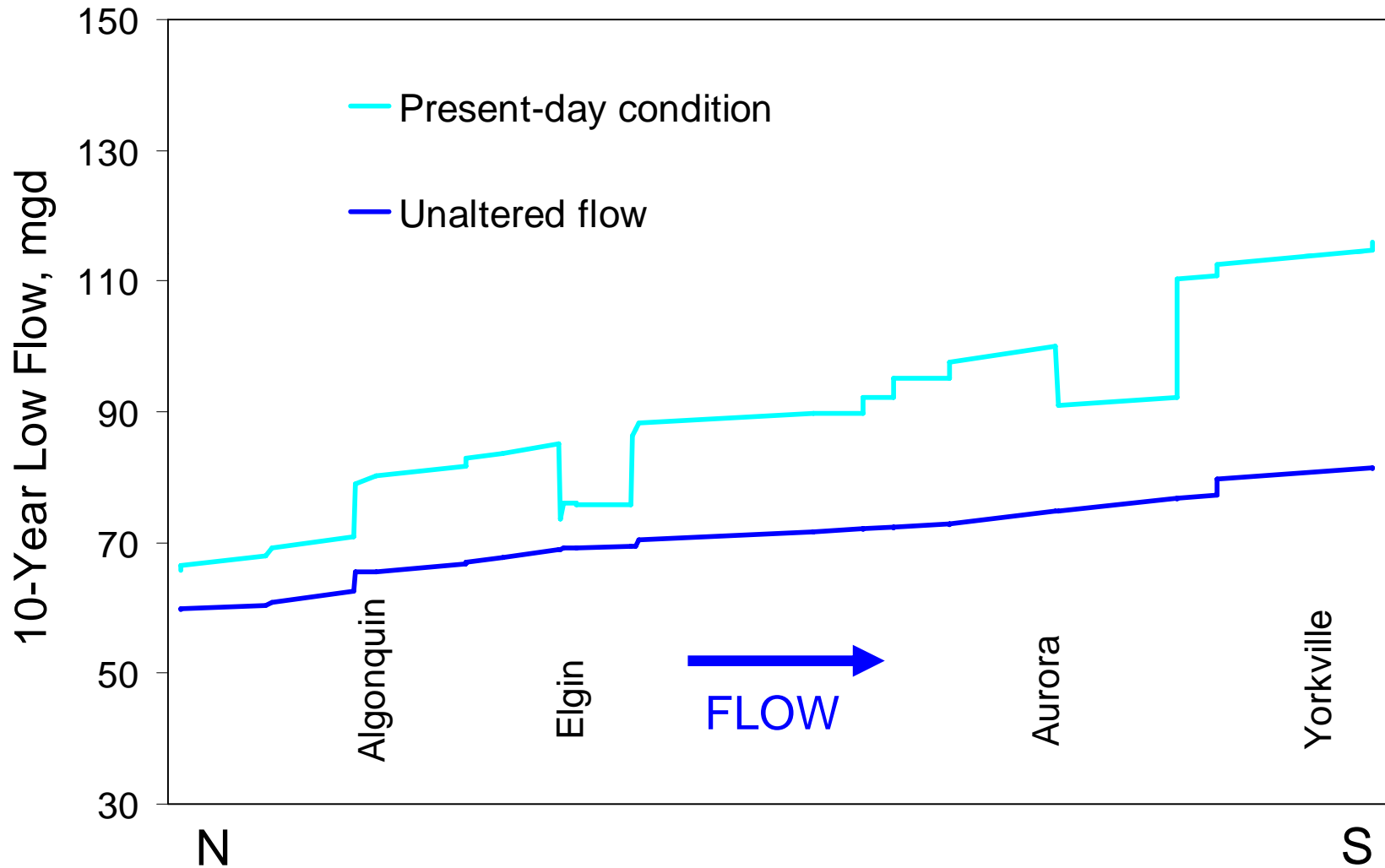
- Historical trend: increasing flows
- Future trends: Will water supply changes in Waukesha reduce its effluent amount or require it to send effluent outside of the basin?


Low Flows Downstream of Stratton Dam

Past increases in withdrawals and effluents
Future changes tied to water use development



10-Year Low Flows along the Fox River





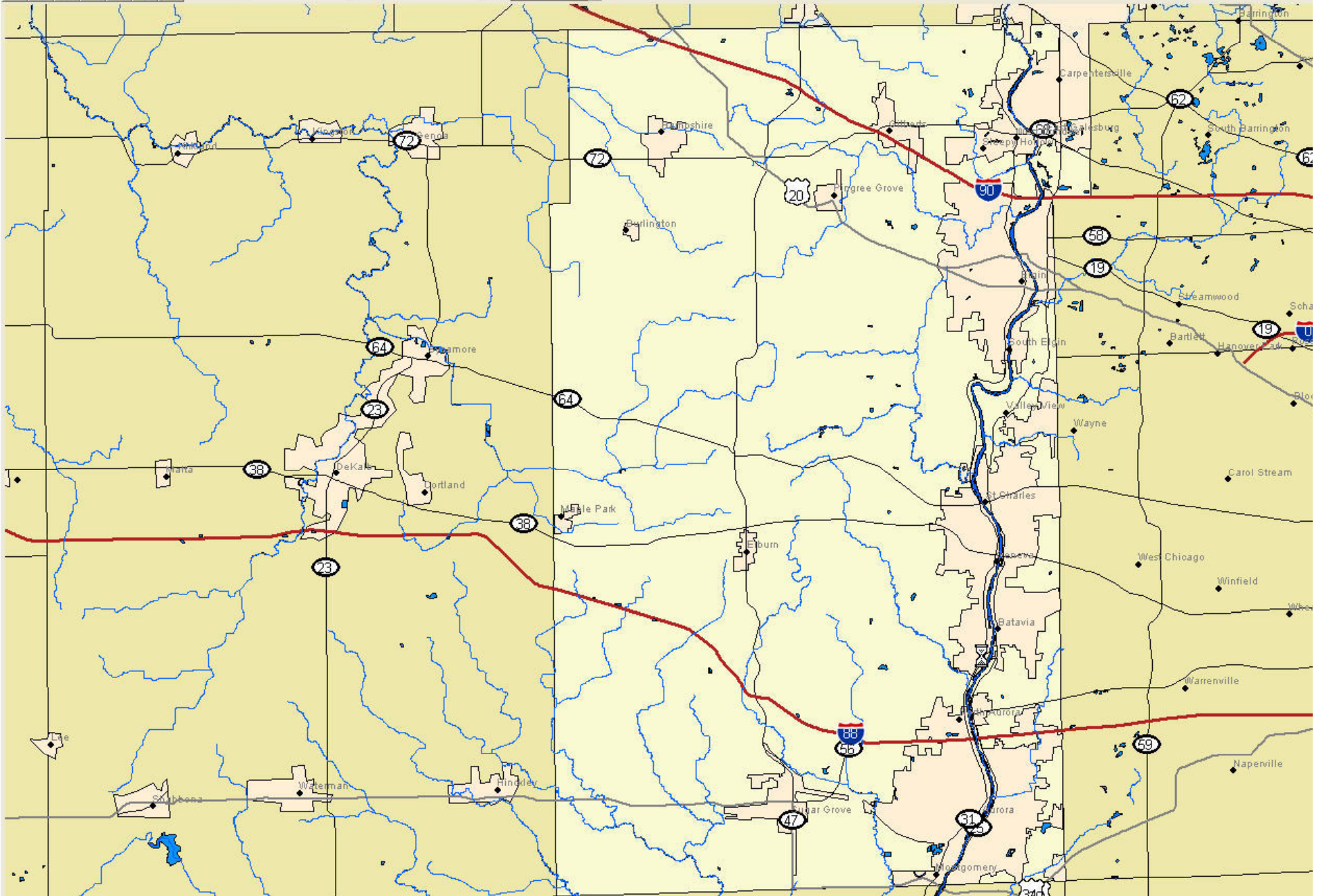
Kane County Surface Water Accounting Model (KC-SWAM)

Primary purpose: To estimate existing flow conditions in regional streams and forecast impacts resulting from selected scenarios of future water use development.

Scenario example shown here: Introducing a hypothetical new wastewater treatment plant on the Fox River south of Geneva



Select Layer Select Feature Find





Select Layer Select Feature Find

Insert New Facility

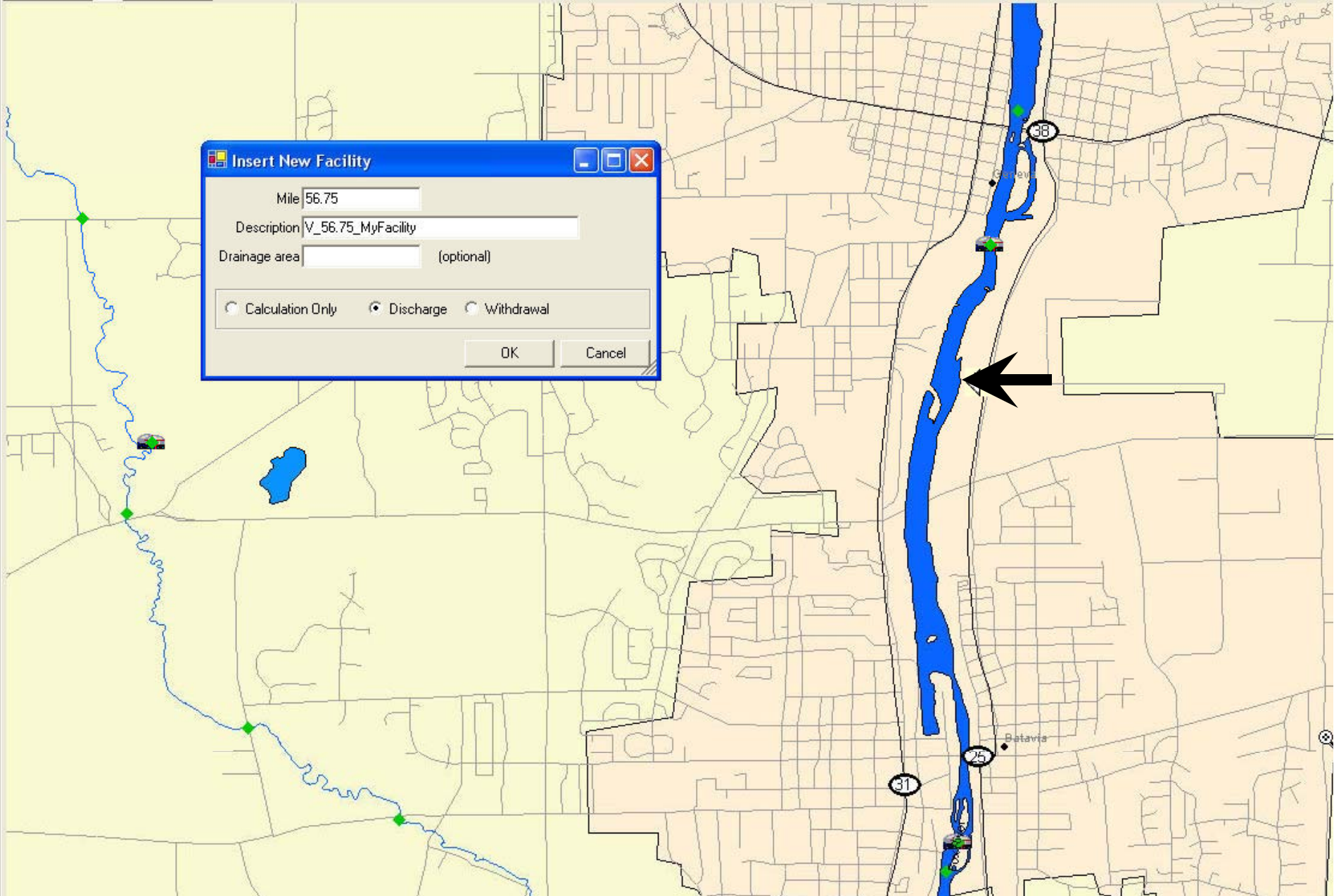
Mile 56.75

Description V_56.75_MyFacility

Drainage area (optional)

Calculation Only Discharge Withdrawal

OK Cancel





Select Layer

Select Feature

Find

MyScenario - Fox Flow Modification Fox River, Mile 56.75

Present Effluent

Average Effluent	<input type="text" value="4"/>	Low Flow Effluent	<input type="text" value="2"/>
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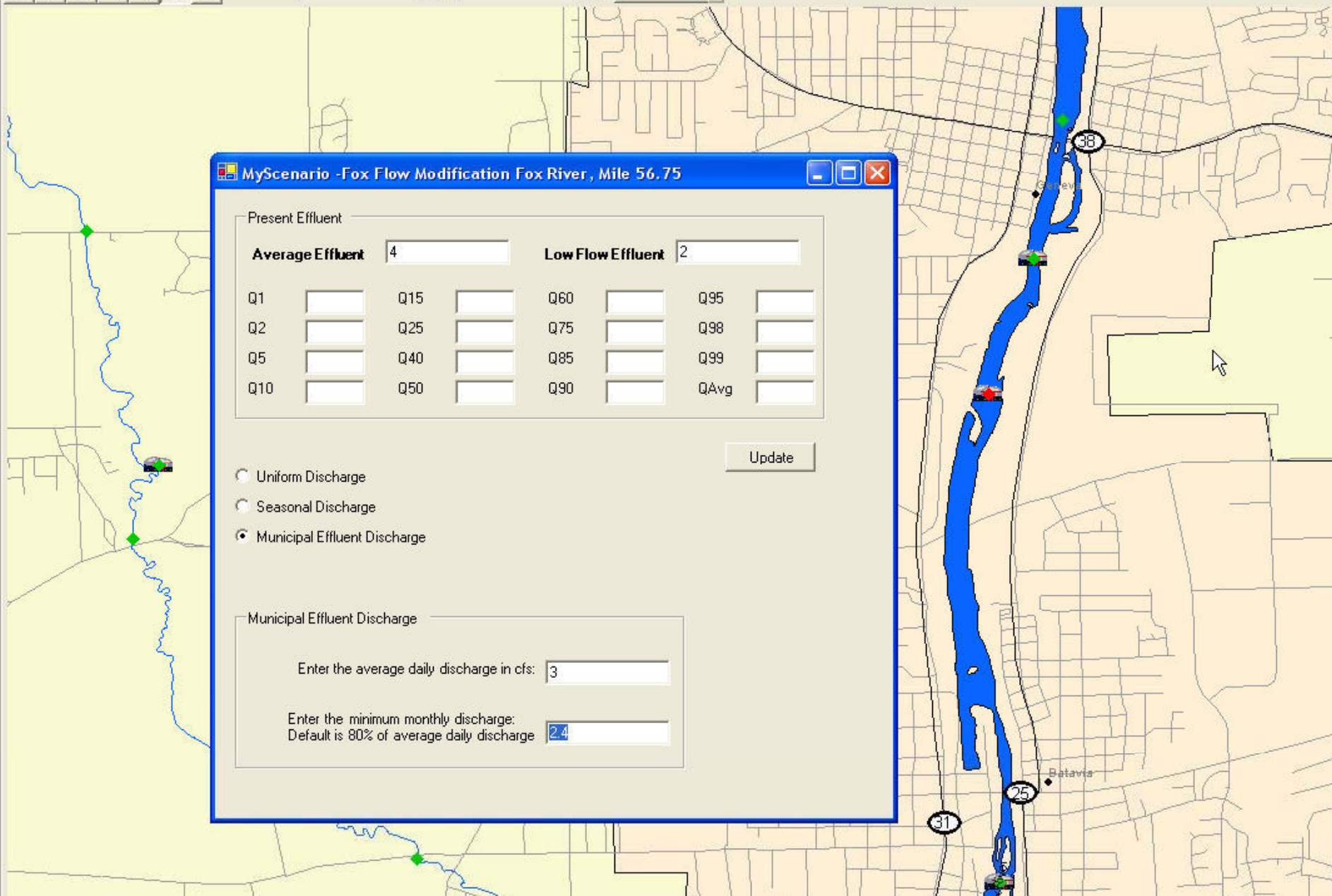
Q1	<input type="text"/>	Q15	<input type="text"/>	Q60	<input type="text"/>	Q95	<input type="text"/>
Q2	<input type="text"/>	Q25	<input type="text"/>	Q75	<input type="text"/>	Q98	<input type="text"/>
Q5	<input type="text"/>	Q40	<input type="text"/>	Q85	<input type="text"/>	Q99	<input type="text"/>
Q10	<input type="text"/>	Q50	<input type="text"/>	Q90	<input type="text"/>	QAvg	<input type="text"/>

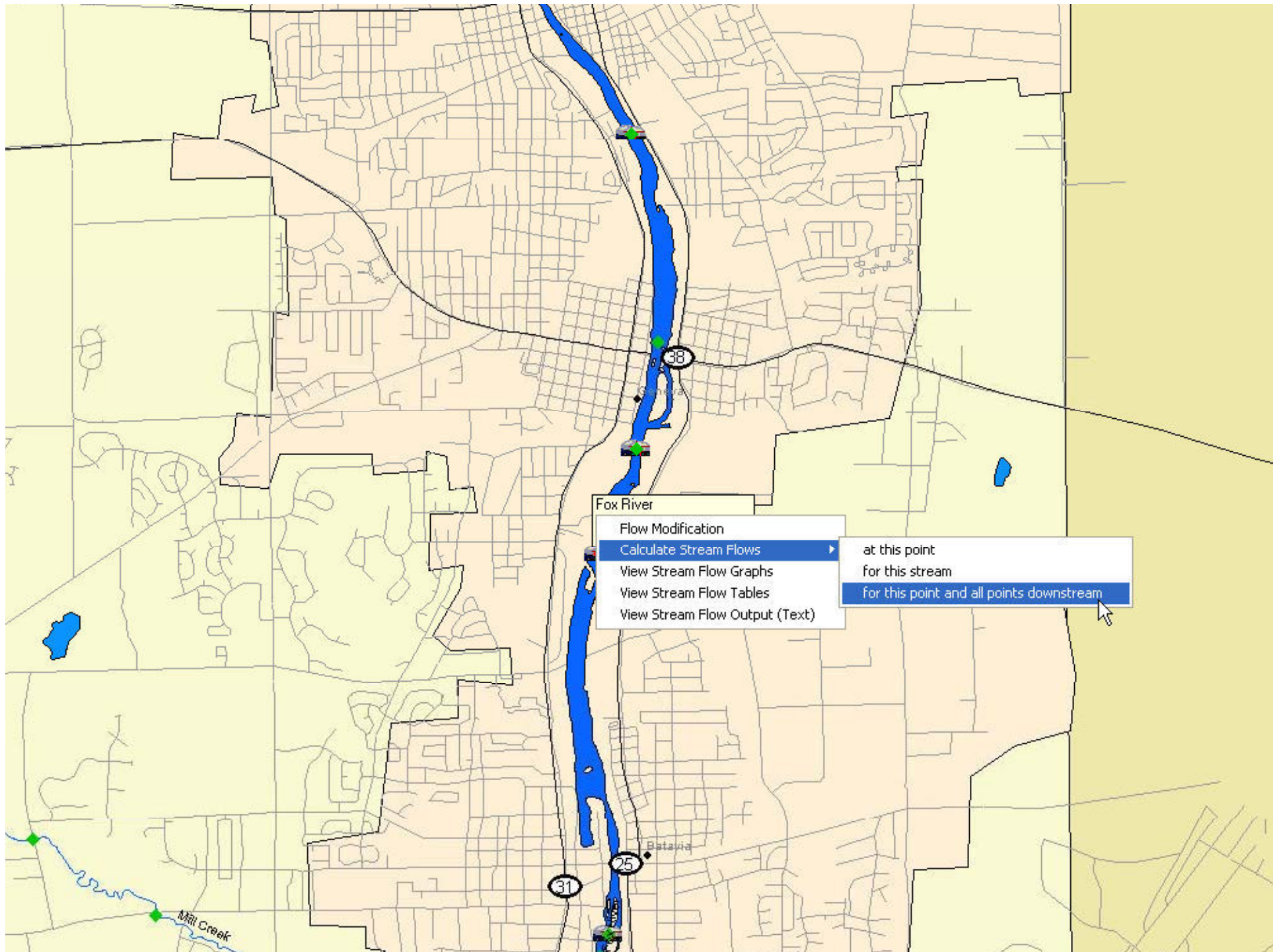
Uniform Discharge
 Seasonal Discharge
 Municipal Effluent Discharge

Municipal Effluent Discharge

Enter the average daily discharge in cfs:

Enter the minimum monthly discharge:
Default is 80% of average daily discharge





Fox River

- Flow Modification
- Calculate Stream Flows
- View Stream Flow Graphs
- View Stream Flow Tables
- View Stream Flow Output (Text)

- at this point
- for this stream
- for this point and all points downstream

Surface Water Accounting Model

File Scenario Action Window Help

Fox River

ANNUAL FLOW DURATION

- Fox River 56.75 V. 56.75 MyFacility
- Fox River 54.8 Batavia sanitary treatment plant
- Fox River 54.7
- Fox River 53.01
- Fox River 53 at Mill Creek (VL)
- Fox River 52.9 Mooseheart Child City & School dischar
- Fox River 50 Upstream of Aurora withdrawal

Fox River

Mile 54.8

Drainage Area: 1661.1

Refresh Data

Low flow

Annual Flow Duration

Drought flow

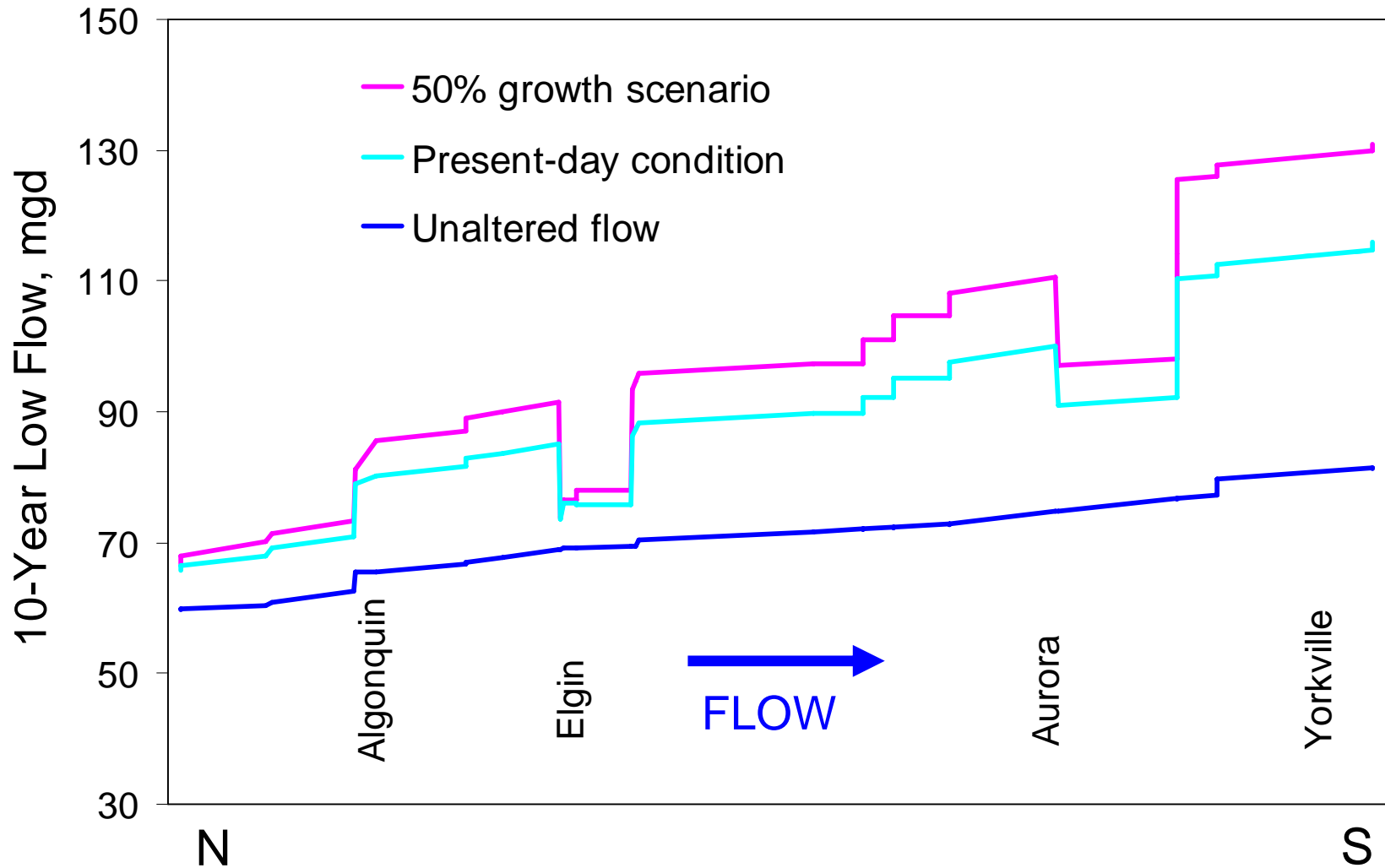
Monthly flow duration

Export Table

Exc. Prob.	Virgin	Present	MyScenario -
1	5291.64	5644.17	5648.73
2	4534.03	4861.08	4865.28
5	3180.31	3396.63	3400.41
10	2371.84	2530.06	2533.6
15	1941.7	2088.18	2091.54
25	1399.97	1515.71	1518.89
40	944.43	1043.43	1046.43
50	738.85	837.48	840.39
60	573.38	666.64	669.46
75	393.91	477.43	480.07
85	298.61	368.64	371.16
90	252.45	304.99	307.39
95	189.28	227.33	229.61
98	141.97	172.15	174.25
99	119.81	154.26	156.18
Avg	1103.38	1225.38	1228.38



Fox River Low Flows: 50% Growth Scenario





Use of KC-SWAM for Building Water Use Scenarios

- KC-SWAM can help identify preferred locations for siting new facilities to minimize adverse impacts on Fox River low flows.
- Once a scenario using KC-SWAM has been created, additional modifications can be built on as alternative plans are formulated.
- Water use scenarios can be saved and shared



Summary

- Future low flow availability on the Fox River will depend primarily on: 1) water use development and 2) the impact of climate variations on drought.
- KC-SWAM can be used to assess potential impacts on Fox River flows resulting from various water use growth scenarios ...
- Leading to a better understanding of potential stream conditions, and ...
- Development of more effective alternative plans.