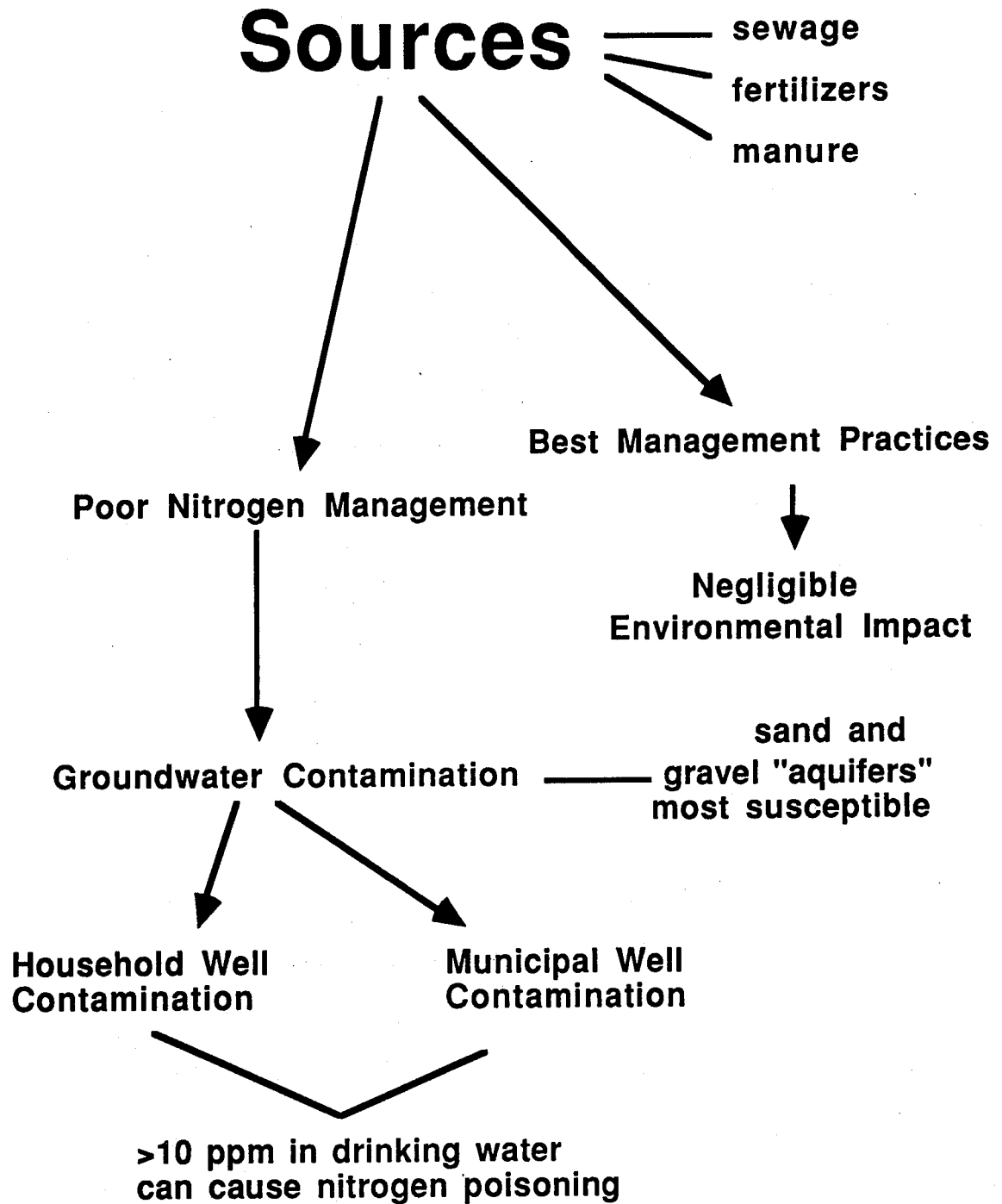


# Nitrogen Cycle

## A Drinking Water Well Problem



# **Pollution Signals**

- \*Aquatic Weeds**
- \*Algae Blooms**
- \*Cloudy Water**
- \*Fecal Bacteria**

# Pollution Sources

<u>Source</u>	<u>Pollutants</u>
*Inadequate Septic Systems	nutrients and bacteria
*improperly sited and designed development	sediments
*improper disposal of household hazardous wastes	chemicals
*unprotected (no erosion control) stream and road banks	sediments
*excessive or poorly-timed application of fertilizers and pesticides	nutrients & chemicals
*inappropriate disposal of plant or animal matter in or near streams	nutrients

# **Supporting Evidence**

## **\*Lake Testing**

Keuka Lake Association in cooperation with Yates Soil and Water, Cornell University, and N.Y. certified testing laboratories

## **\*Herring Surveys**

A 1988 sanitary survey (septic systems) of about 900 systems in the Keuka Lake Watershed. and a 1987 opinion poll of watershed residents conducted by John Herring, Cornell University and Yates County.

## **\*Other Lake Studies**

Studies on other Finger Lakes, Lake George, and lake around the country show similar pollution problems due to "nonpoint source pollution".

## **\*Resident Testing**

# Lake Testing

(KLA, Cornell, Yates County, Corning, Alfred)

## \*Water Clarity\*

(using a secchi disk)

<u>Year</u>	<u>Depth</u> (summer average)
1973	7 m
1988-'91	<5 m

Lake aging may be a problem.

# **\*Fecal Bacteria\***

**Surface samples (<3 feet) collected around the lake between 1986-1991 within 100 feet of shoreline.**

**Range of Results: 0 to 2,000 fecal counts**

**9 out of 10 samples**

**Fail drinking  
water standard  
(<1 count/100ml)**

**2 out of 10 samples**

**Fail surface  
water standard  
for Keuka Lake  
(50 count/100 ml)**

**4 out of 100 samples**

**Fail surface  
water standard  
for swimming  
(200 counts/100ml)**

**This is a health concern.**

# Septic System Study

(John Herring, Cornell and Yates County, 1988)

Sample Size-839

**83% Septic tanks undersized  
by today's standards**

**62% Septic tanks not  
inspected or pumped  
in 10 years**

**22% Septic tanks not  
inspected or pumped  
in 20 years**

# **Septic System Life Expectancy**

***10 to 25 years***

**(Cornell Cooperative Extension)**

**Many septic systems in the watershed are probably not functioning properly.**



# **Economic Facts**

**\*Property Values**

**\*Tourism and Recreation**

**\*Future Development**

**Land Use**



**Pollution**



**Water Quality**



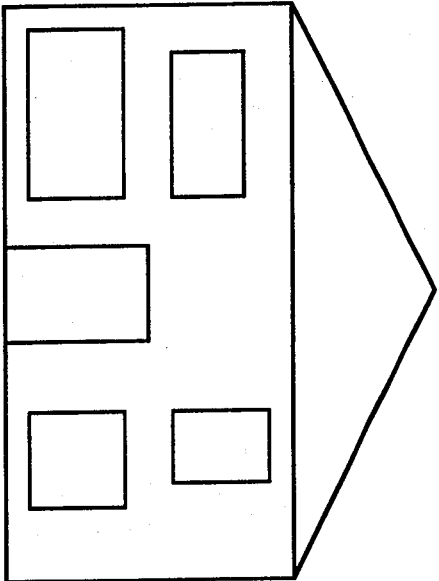
**Property Values**



**Tax Base**

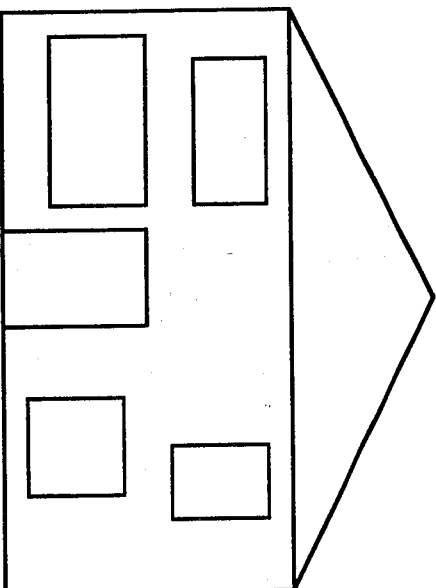
# Value of Property on Clean vs. Polluted Lake

(Lake George Study)



"Clean Lake"

\$100,000



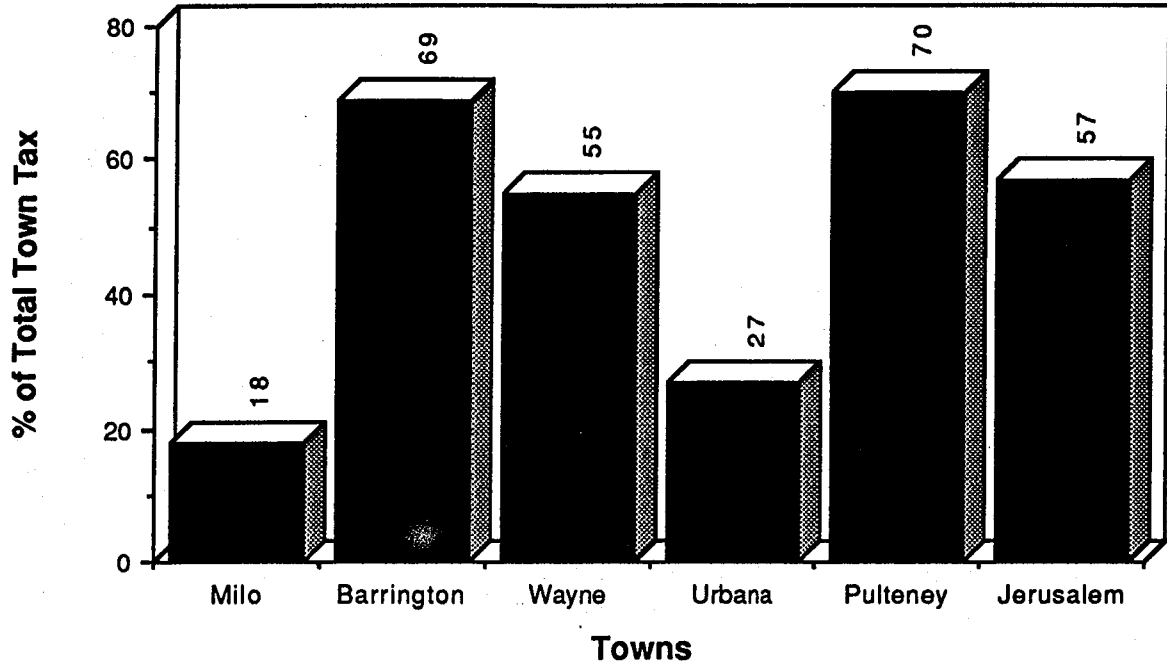
"Polluted Lake"

\$80,000

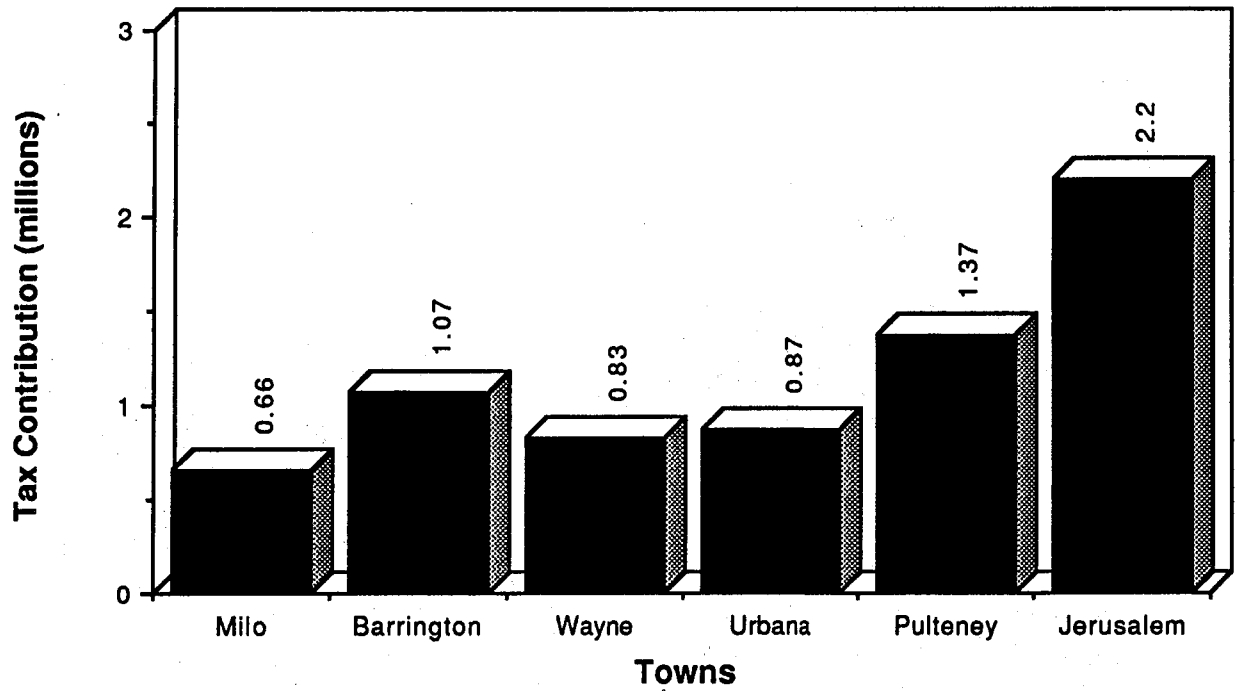
**How does water quality affect properties in  
the Keuka Lake Watershed?**

### Lake Property Tax Contribution-% of Total

(All Taxes, April 1991)

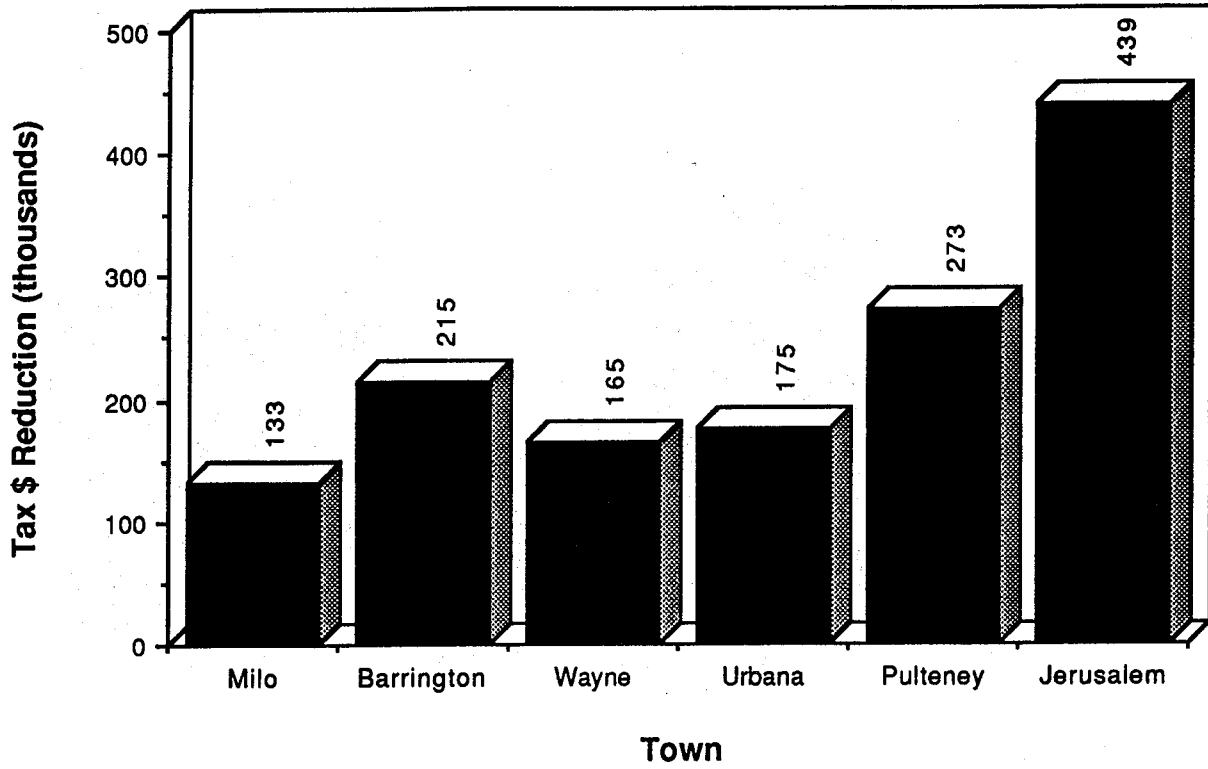


### Lake Property Tax Contribution

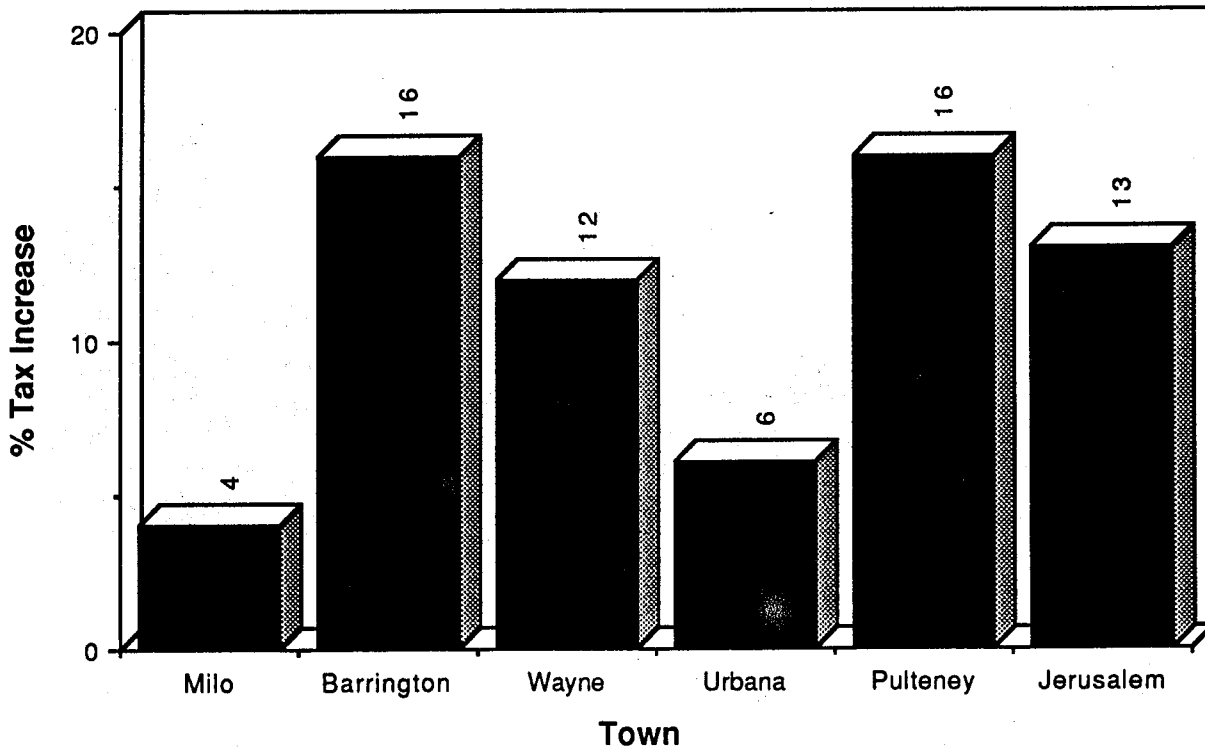


Source: Yates and Steuben Tax Offices

**Tax \$ Lost From a 20% Reduction in Lakeshore Properties**



**Required Tax (%) to Offset a 20% Lake Base Reduction**



# Tourism and Recreation Impact

<b>Tourism Indicator</b>	<b>Steuben County</b>	<b>Yates County</b>
<b># of Businesses</b>	<b>284</b>	<b>69</b>
<b># of Employees</b>	<b>2,498</b>	<b>388</b>
<b>Payroll (1987)</b>	<b>\$24.05 million</b>	<b>\$2.8 million</b>
<b>Overall Economic Impact (1987) w/out multiplier</b>	<b>\$52.70 million</b>	<b>\$5.7 million</b>

**Source: Finger Lakes Association**

# **Desirable Future Development**

Depends on a high quality

**Environment**

# **Public Health and Safety**

- \*Drinking Water**
- \*Swimming**
- \*Boating**
- \*Docks, Moorings, etc.**



# 18,950

## residents drink water from the lake

<u>Supply</u>	<u>Residents</u>	<u>Protection*</u>
<b>Municipal(all)</b>	<b>9,650</b>	<b>Yes</b>
Penn Yan	6,820	Yes
Keuka Park	945	Yes
Dresden	645	Yes
Hammondsport	1240	Yes
<b>Private (Resident)</b>	<b>9,300 (all)</b>	<b>Yes/No</b>
Private Resident w/ treatment**	4,650	Yes
Private Resident w/out treatment	4,650	No

\*municipal chlorination w/ state/federal controls

\*\*homeowner sanitation, no government oversight or control

# **Keuka Lake Watershed Project**

**KLA has assumed a catalyst role to  
address watershed issues.**

**Why?**

# **History**

**1963-Watershed Compact**

**1983-Towns start to pull out**

**1986-Effort by Yates County  
and J. Herring to form  
a watershed district**

**1989-Watershed district  
effort dropped**

**1991-KLA initiates watershed  
project because of  
non-uniformity of  
watershed inspection  
and enforcement**

# Watershed Resident Survey

(Herring, 1988)

- 1) Residents recognize that water quality in Keuka Lake has declined over the years;
- 2) Residents think that the current programs are not addressing the problems;
- 3) Residents think more regulations are necessary;
- 4) Residents are willing to pay for increased services (estimated at \$200,000);
- 5) Residents identified a watershed-level program as most appropriate level of government to handle problems.