

# Chapter 10

## Data Interpretation



# What is normal?

You don't know what's normal until you spend some time getting to know your stream...



# What is normal?

Level or results of concern

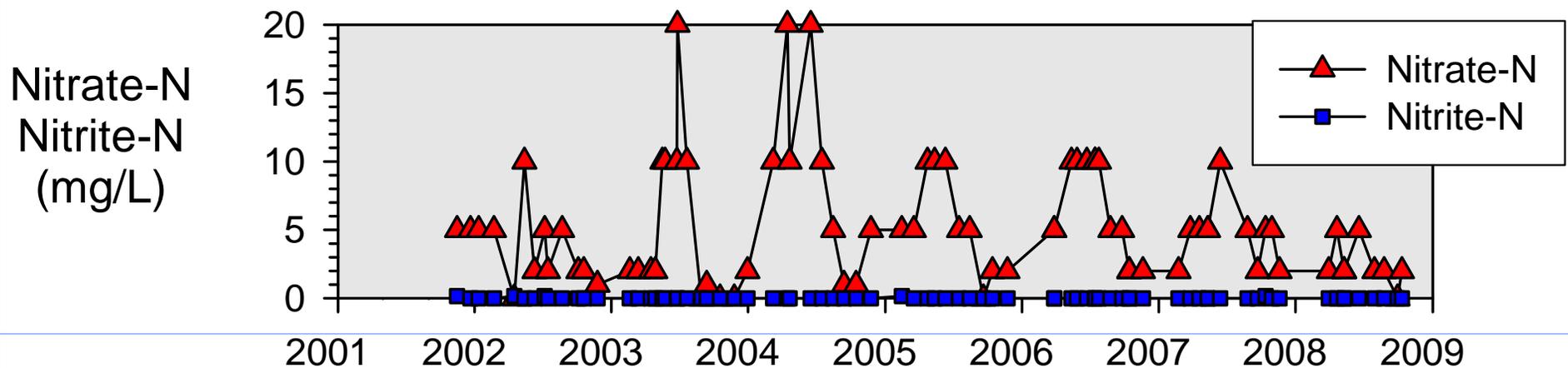
- **Chemical/Physical Assessments:**

- Nitrite values of **0.3 or greater** (0.3, 1.0, 1.5 & 3.0 mg/L)
- Nitrate values of **20 or greater** (20 or 50 mg/L)
- Phosphate values of **0.6 or greater** (0.6, 0.8, 1.0-8.0, 10 mg/L)
- Dissolved Oxygen values of **5 or less** (1-5 mg/L)
- pH values of **6 or less** (4, 5, 6)
- Chloride values of **100 or greater** (100 - >600 mg/L)

# How often should you collect data?

- IOWATER recommends a minimum of monthly sampling.
- Will depend on your monitoring plan and goals.

985040 - Squaw Creek at Fourth St. in Ames (Story Co.)

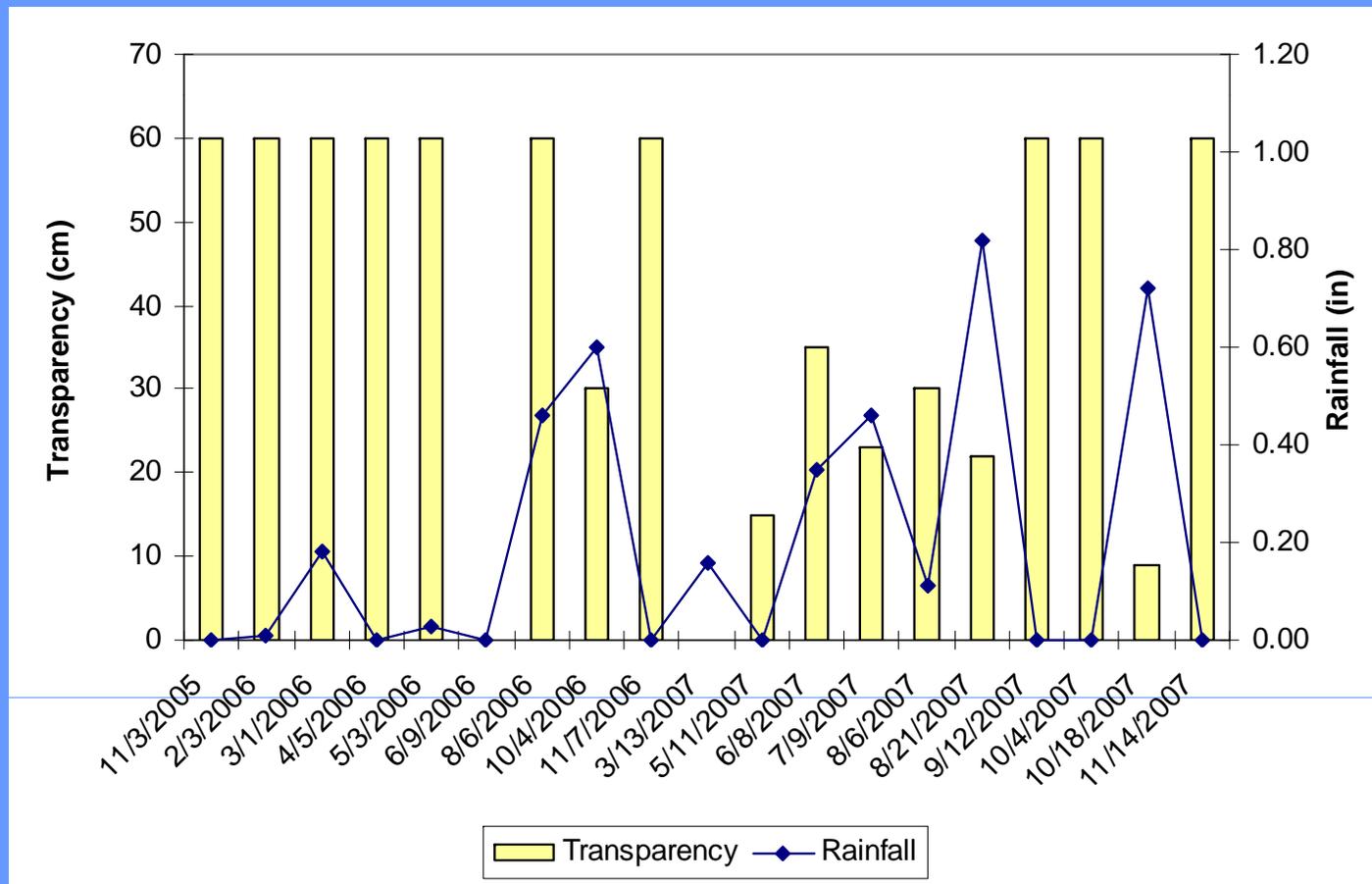


# Factors that Affect Water Quality - Land Use

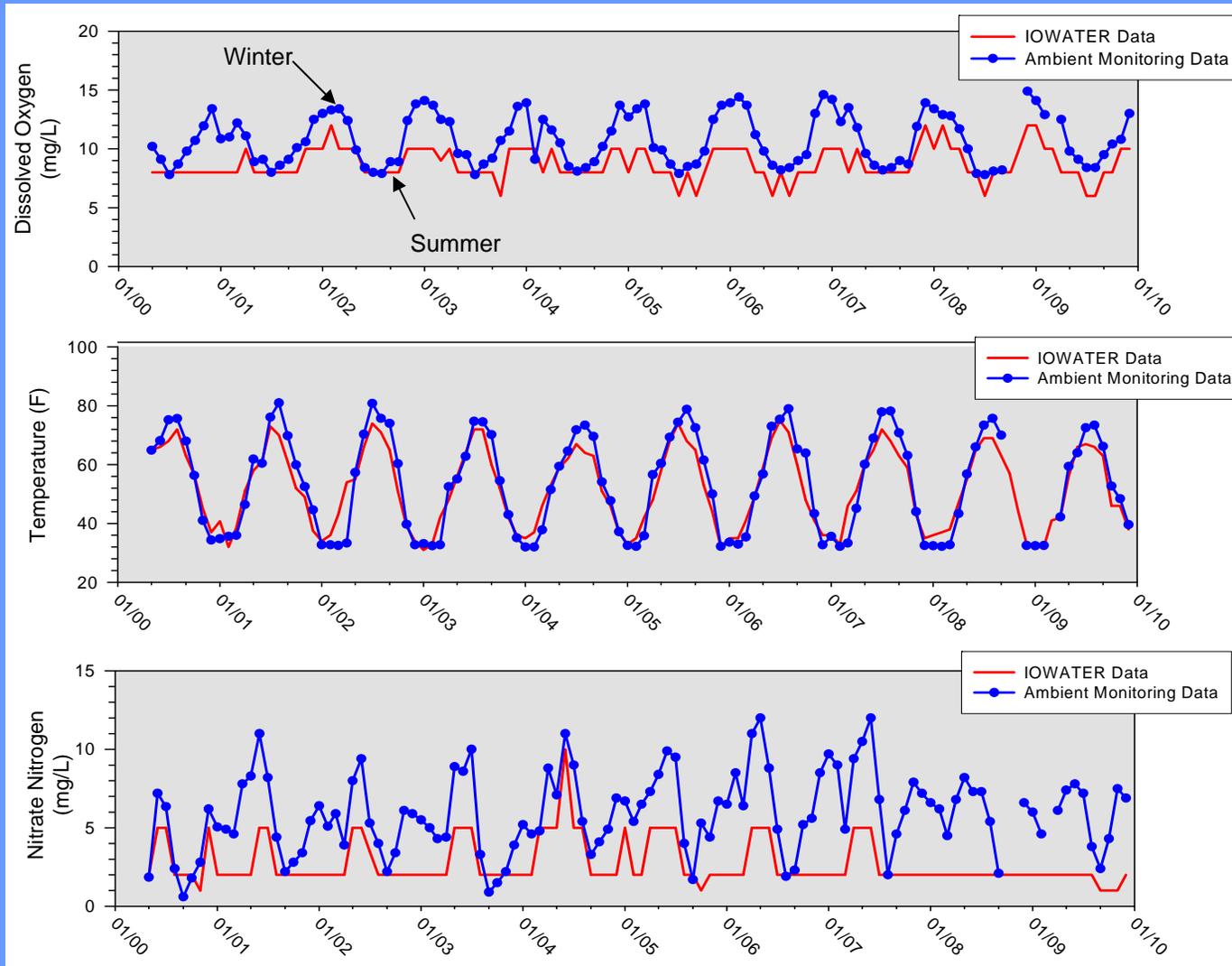
- Regional Differences
  - Northeast – rugged topography, spring-fed streams, higher transparency, lower nutrients.
  - North Central – flat topography, mainly row crops, tile drainage, higher transparencies, higher nutrients
  - West – loess hills, rolling plains, forest, grassland, and row crops, low transparency
  - South – irregular plains, low hills, forest, pasture, row crops, lower nitrogen, variable water quality

# Factors that Affect Water Quality - Precipitation

- Precipitation tends to increase non-point source pollution.
- Precipitation tends to decrease point source pollution.

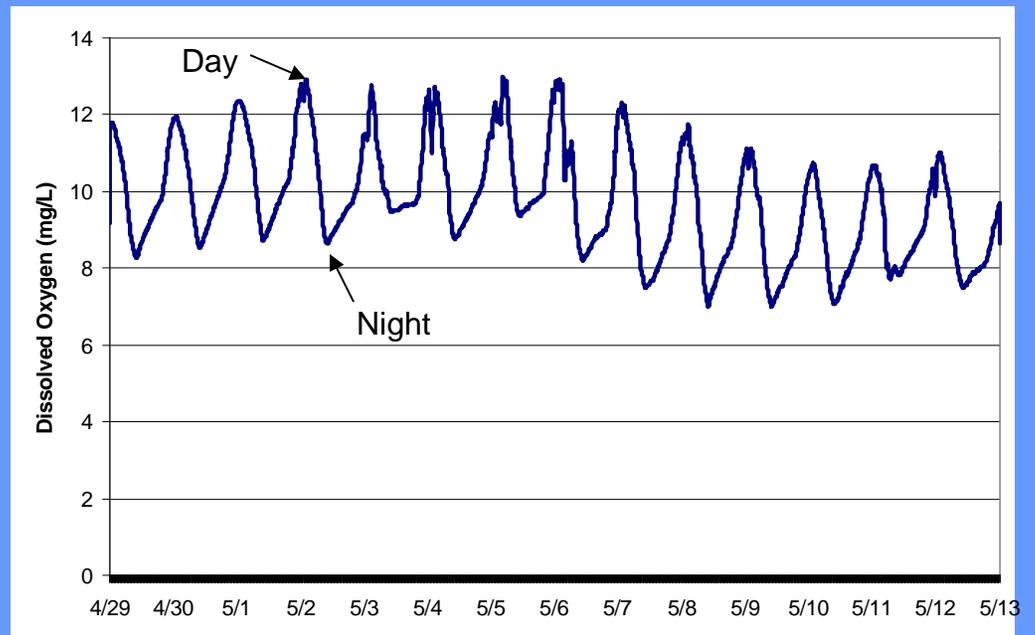


# Factors that Affect Water Quality - Season



# Factors that Affect Water Quality - Time of Day

- Temperature and Dissolved Oxygen vary depending on the time of day.

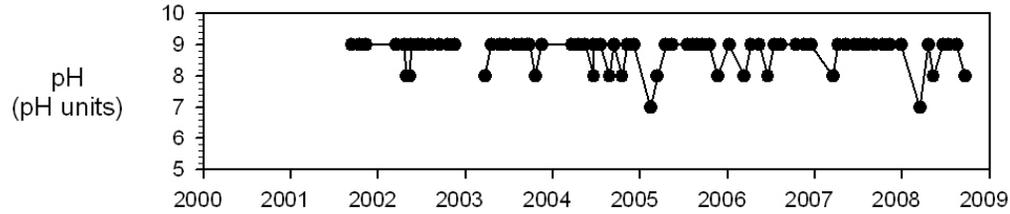


# Factors that Affect Water Quality - Physical Influences

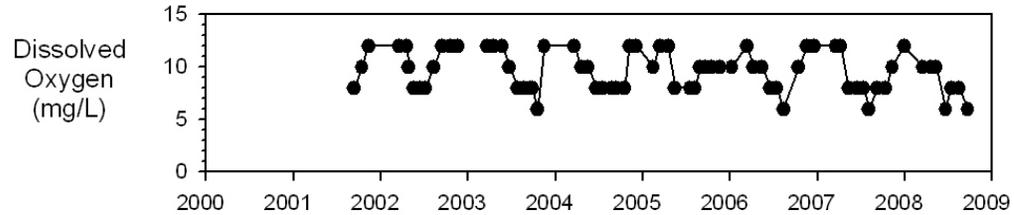
- Canopy Cover
- Shading
- Macrohabitats



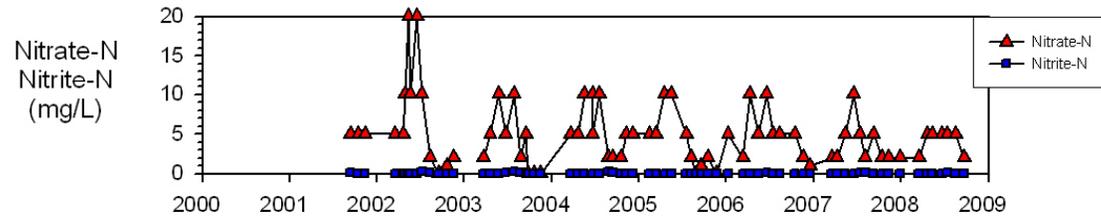
908019 - Montgomery Creek 1 (Boone Co.)



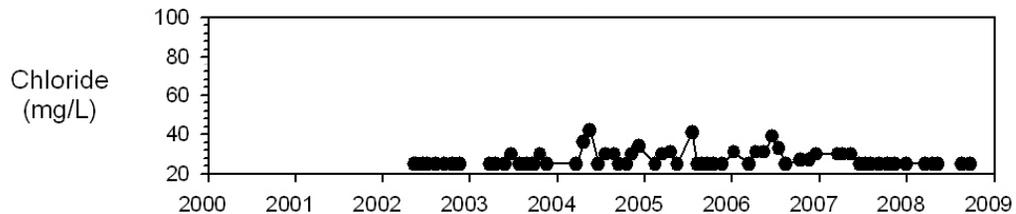
Long-term data sets are extremely valuable in determining what is normal for a site and how water quality at a site varies throughout the year.



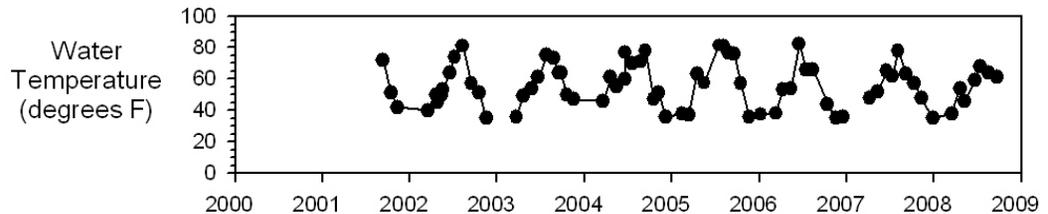
Montgomery Creek is a warm water stream. Dissolved oxygen results meet the 5 mg/L standard. Data show a seasonal trend.



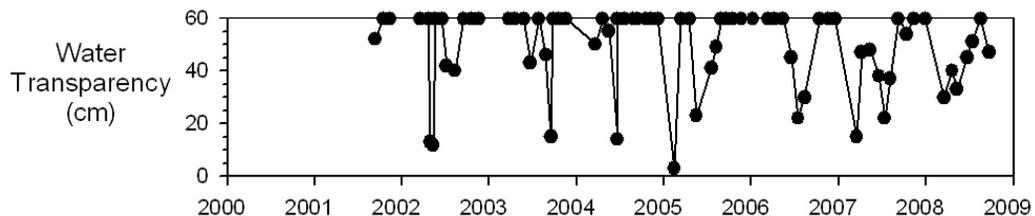
Nitrate-N shows a seasonal pattern, with higher values during the late spring/early summer months.



Chloride has been detected, but at low concentrations.

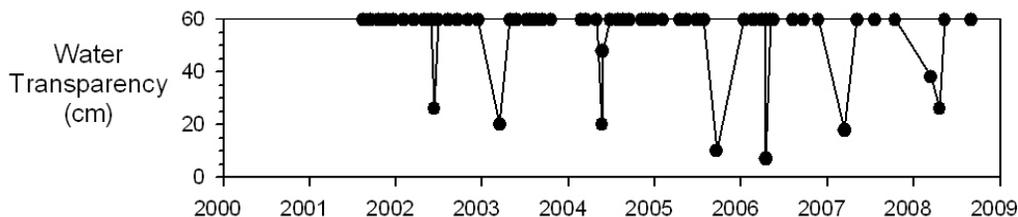
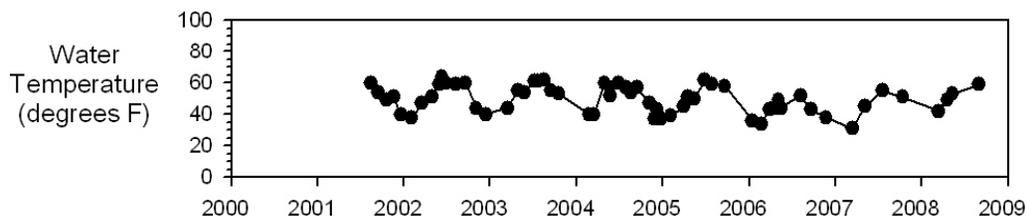
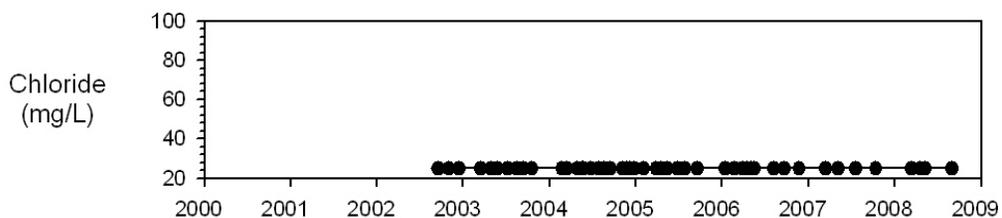
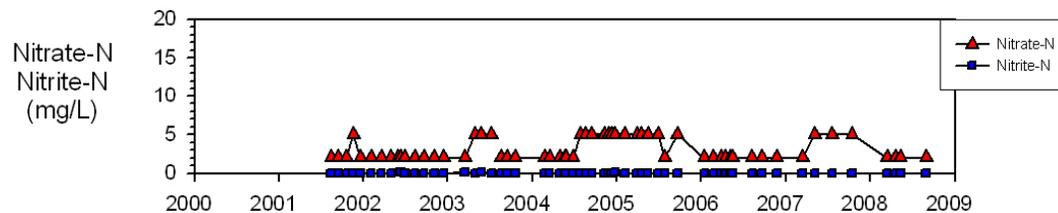
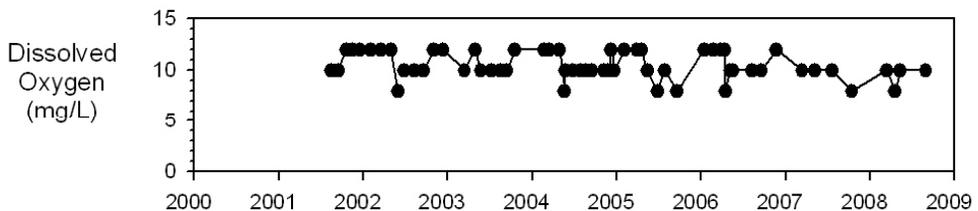
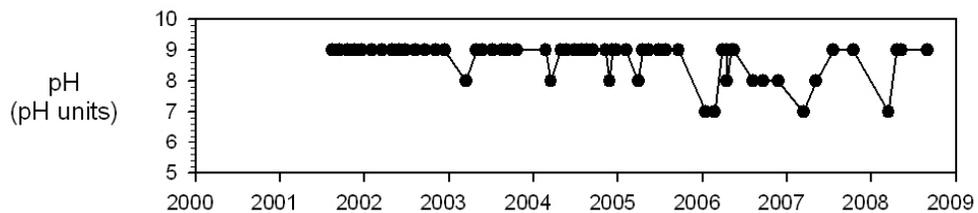


Seasonal pattern to water temperature. Greater range in temperature given that this is a warm water rather than a cold water stream.



Transparency is variable. Lower values are not necessarily related to rainfall events.

### 996040 - North Bear Creek (Winneshiek Co.)



*North Bear Creek is a coldwater stream which means a dissolved oxygen standard of 7 mg/L applies.*

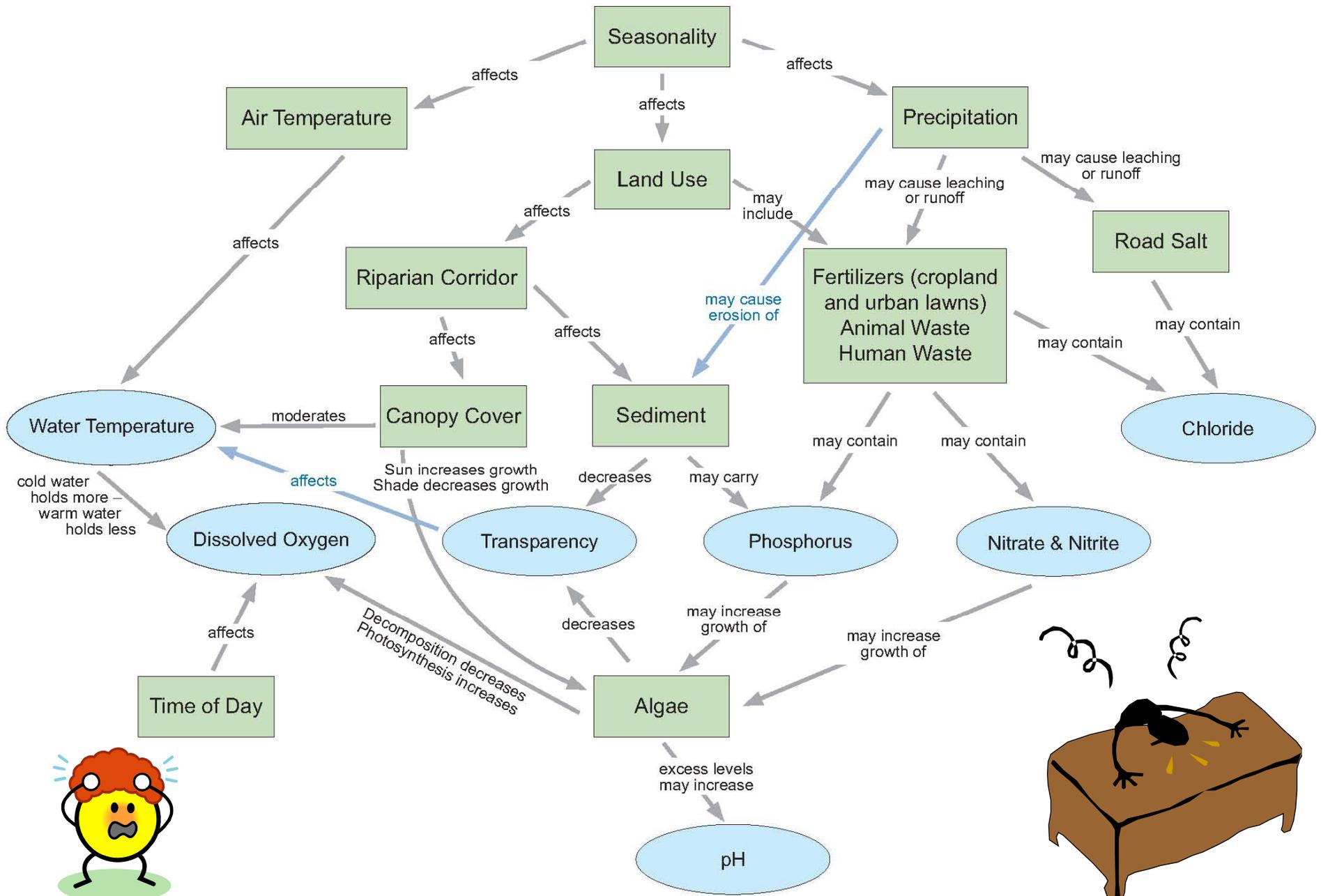
*No occurrence of nitrite-N. Nitrate-N tends to be relatively low at 2 to 5 mg/L.*

*No problem with chloride.*

*Seasonal variability in temperature. Not as great of a range in temperature as occurs with a warm water stream.*

*Transparency generally 60 cm except following rainfall events.*

# Interrelationship among Chemical and Physical Parameters



# Abnormal Sampling Results

How to differentiate between “normal” and “abnormal”

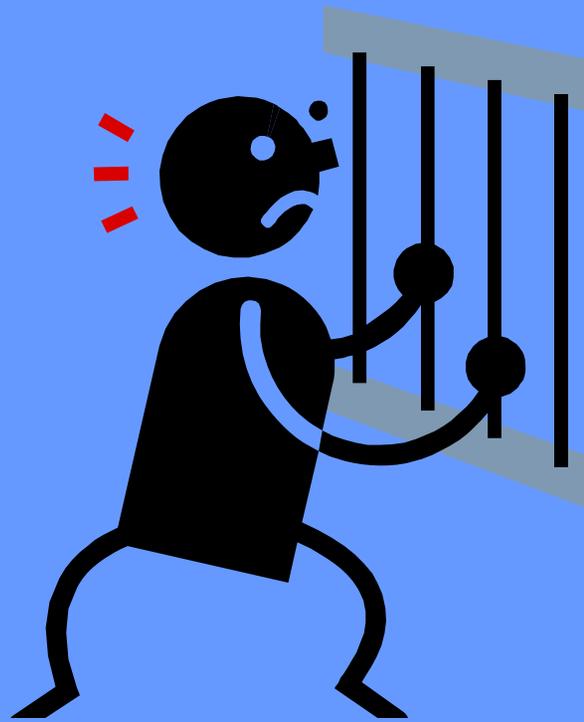
If you think your results are abnormal

- **RETEST** – double check results
  - And check expiration dates!
- Ask someone else to double check results
- Document as thoroughly as possible
  - Data
  - Pictures
  - Observations
- Contact IOWATER

# Abnormal Sampling Results

How to address them...

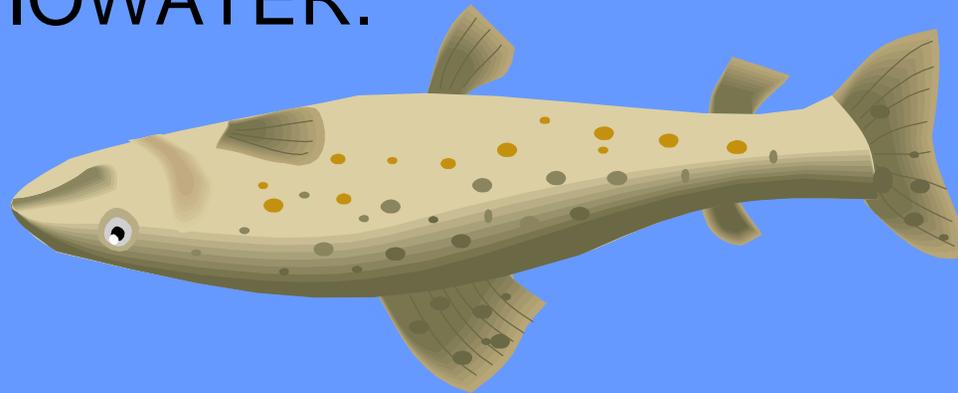
- Evidence of criminal activity that is immediately dangerous, LEAVE IMMEDIATELY and call local law enforcement.



# Abnormal Sampling Results

## How to address them...

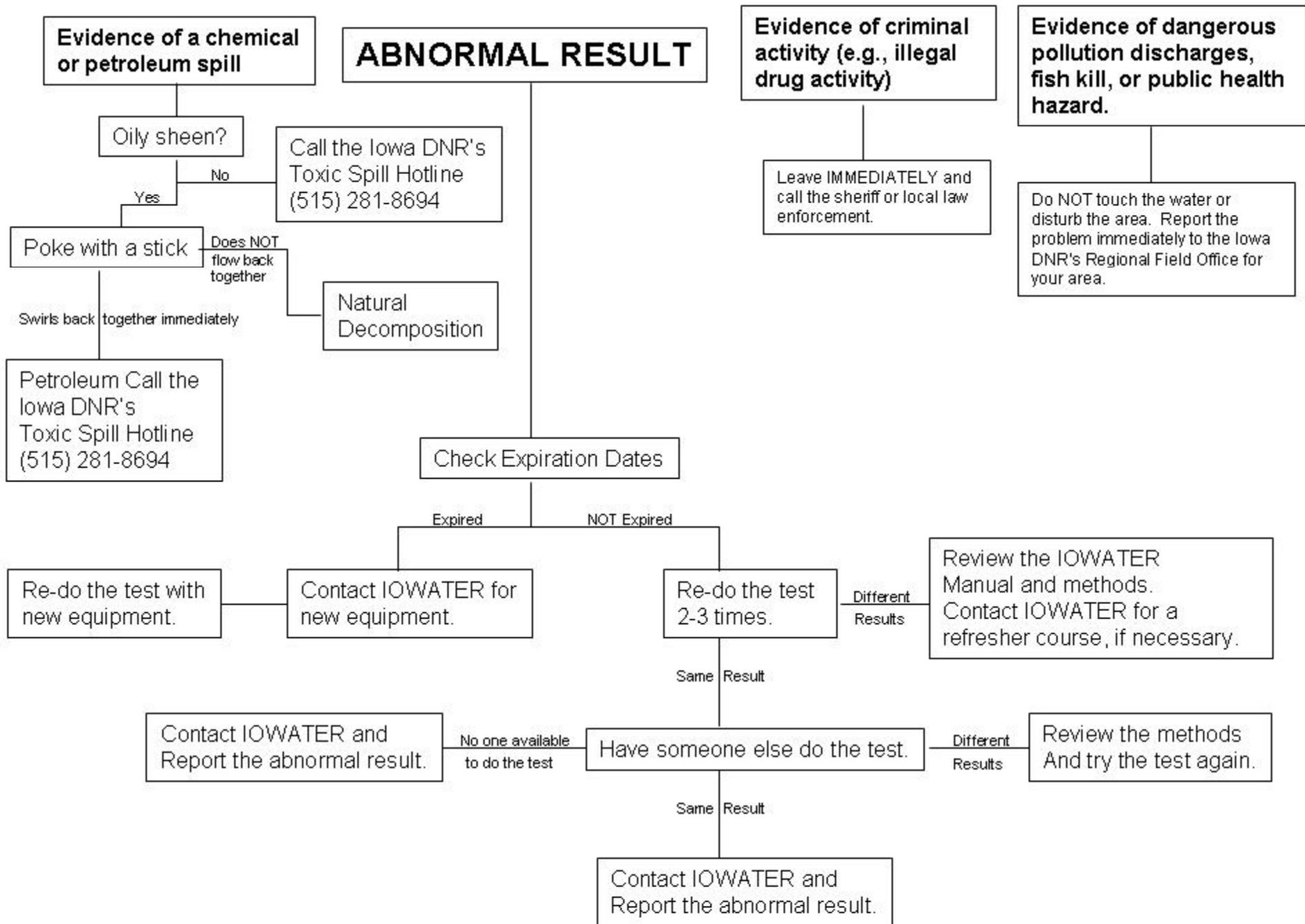
- Pollution discharges, fish kills, or public health hazards – document (by taking photos do not touch the water) and report to DNR Environmental Services Division Field Offices & contact IOWATER.



# Abnormal Sampling Results

## How to address them...

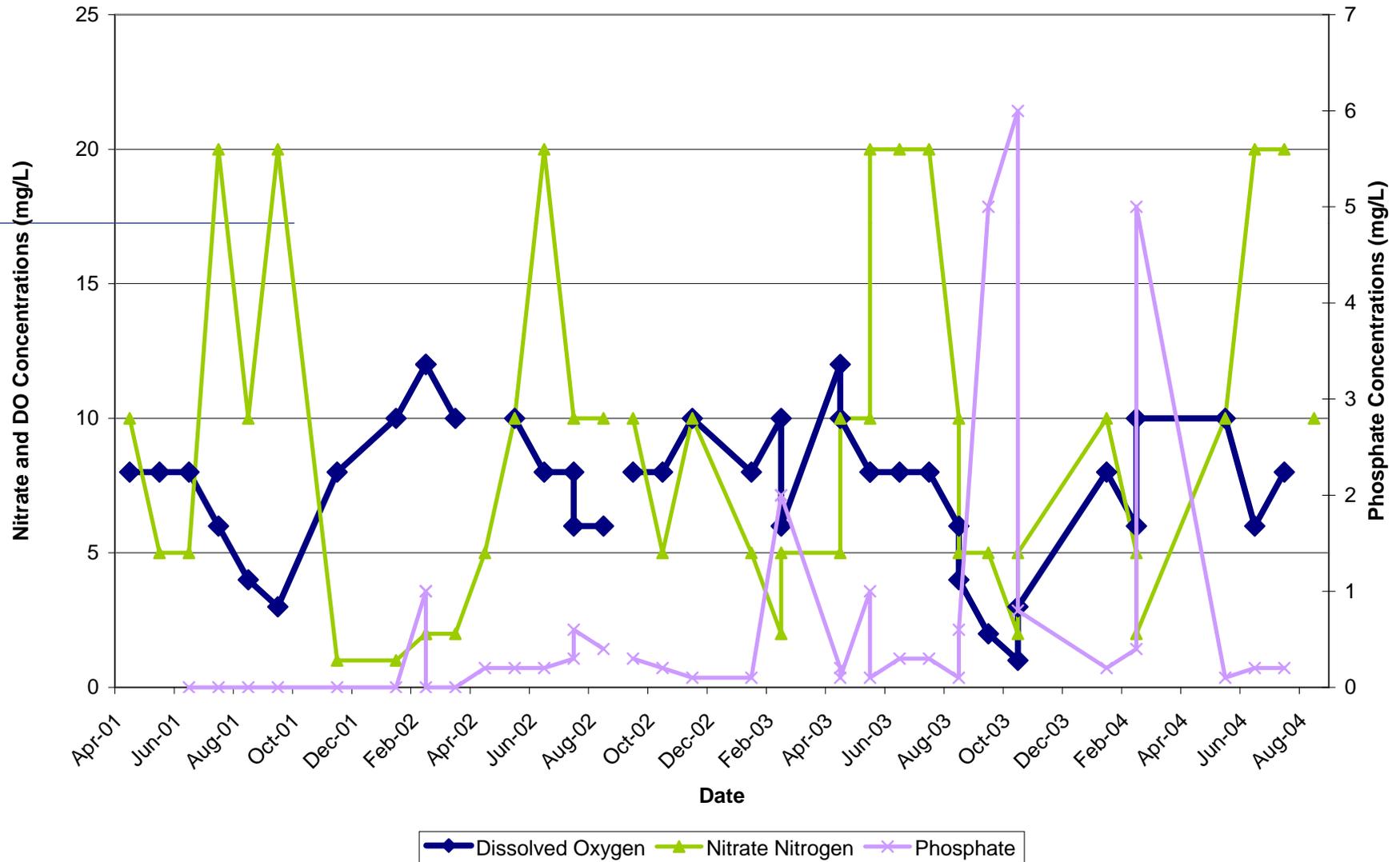
- **Evidence of Oily Sheen** – if oily sheens are present, conduct a simple test to determine whether or not the sheens are natural.
  - Poke the sheen with a stick (not your finger).
    - If the sheen swirls back together immediately, it's petroleum.
    - If the sheen breaks apart and does not flow back together, it is from bacteria or plant or animal decomposition.
- If it is chemical, and could be a hazard, call DNR Toxic Spill Hotline – 515-281-8694.



# Buttermilk Creek

Bruce Voigts & Greg Soenen

DO & Nutrients



# Buttermilk Creek

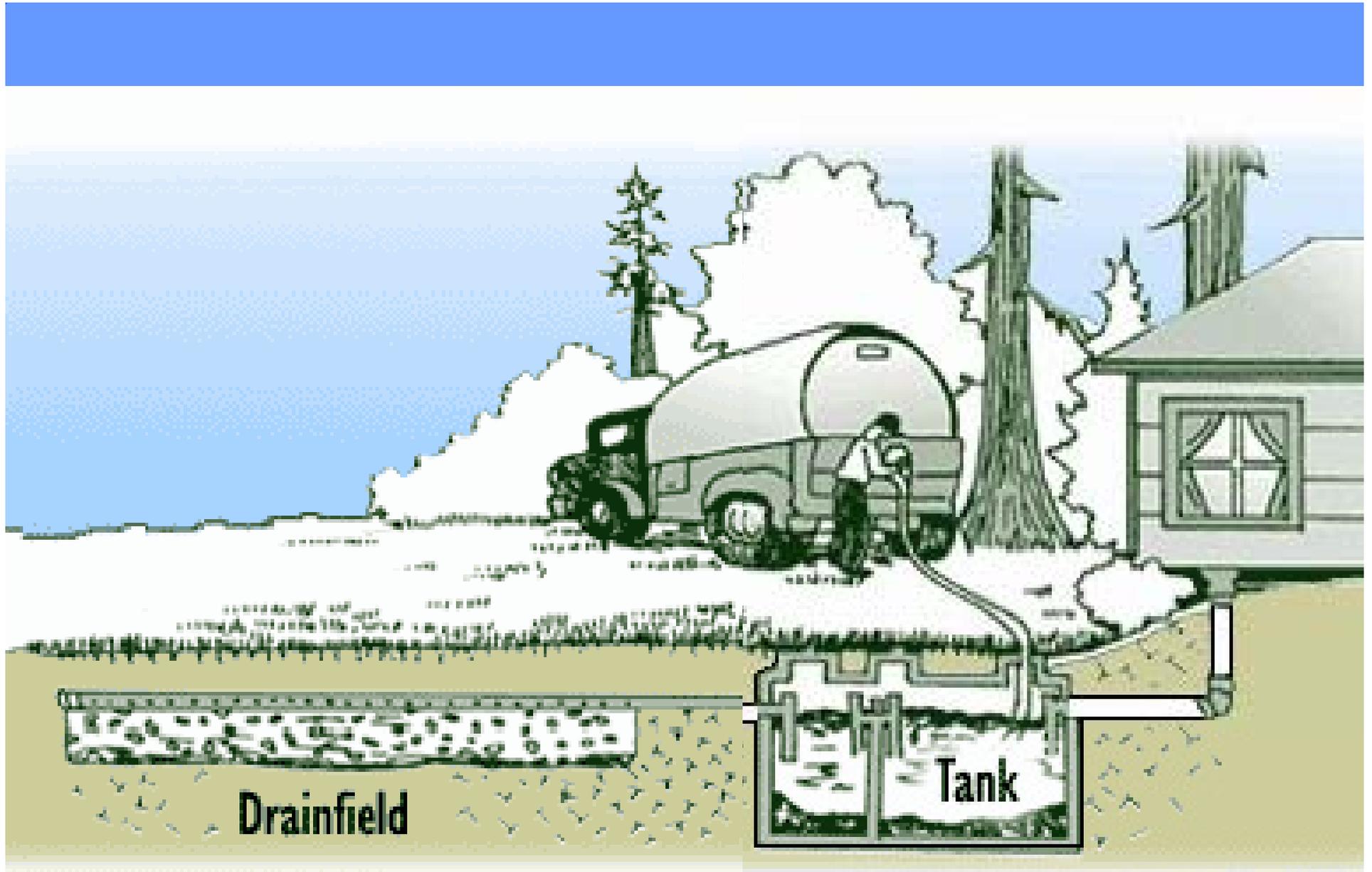
Bruce Voigts & Greg Soenen



Sewage Algae

Bloodworms



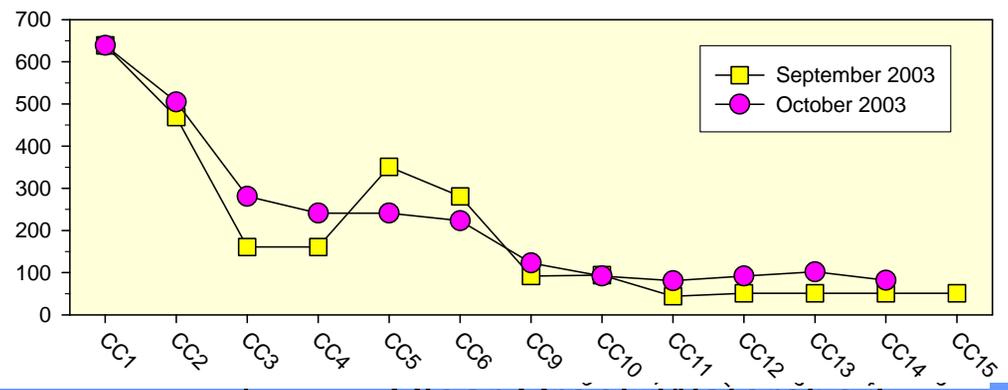


**Drainfield**

**Tank**

County

Chl Chloride (m (mg/L)

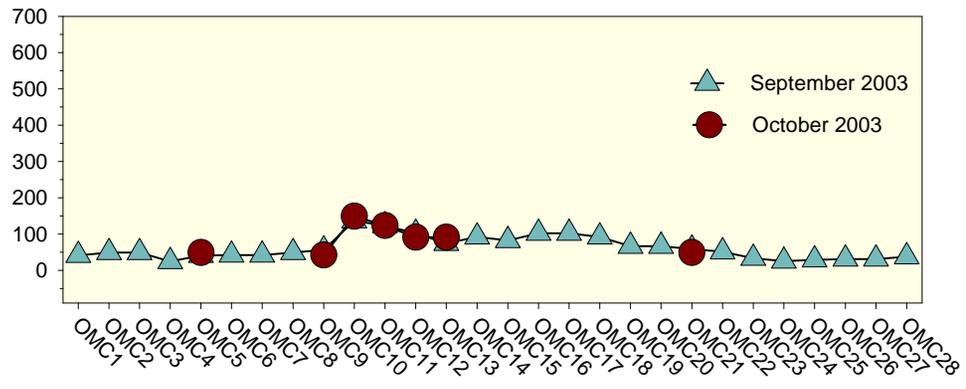


Clear Creek Watershed



Old Mans Creek Watershed

Chl Chloride (m (mg/L)

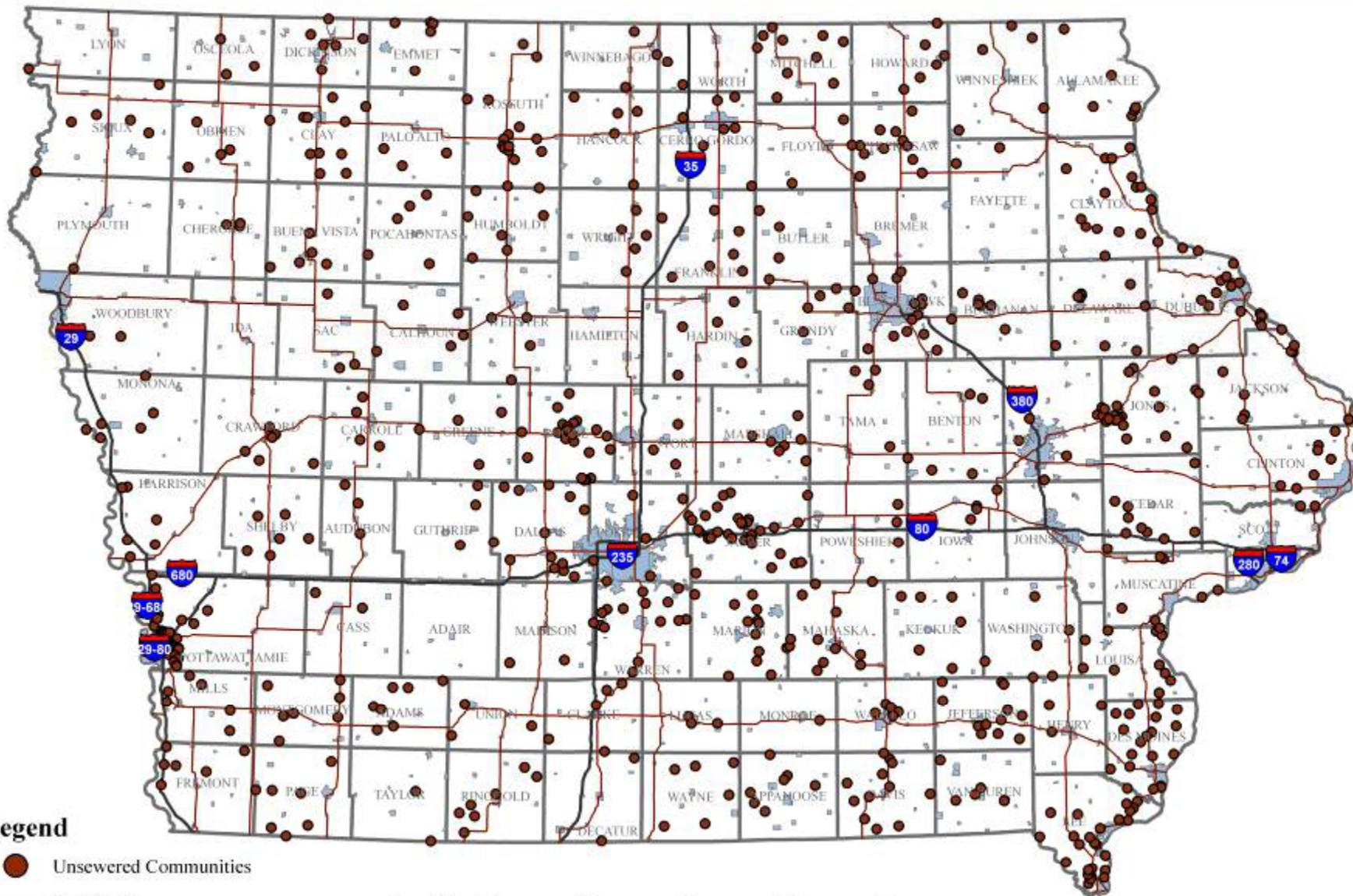


# Unsewered Communities

One example of 739...



# Unsewered Communities in Iowa



## Legend

- Unsewered Communities
- Interstates
- US Highways
- Incorporated Cities



# Lizard Creek



**High Quality Organisms!!!**



# Keys To Credibility

- **Be careful when trying to interpret data.**
  - Credibility may take years to build, but only an instant to destroy.
- **Adhere to IOWATER Code of Ethics**
- **Contact IOWATER with any questions, comments, and/or concerns.**