SAC AND FOX NATION OF MISSOURI IN KANSAS AND NEBRASKA

IMPROVING THE NATION'S WATER QUALITY BY:

MONITORING WATER QUALITY, IMPLEMENTING WATER QUALITY STANDARDS AND IMPLEMENTING CONSERVATION PRACTICES

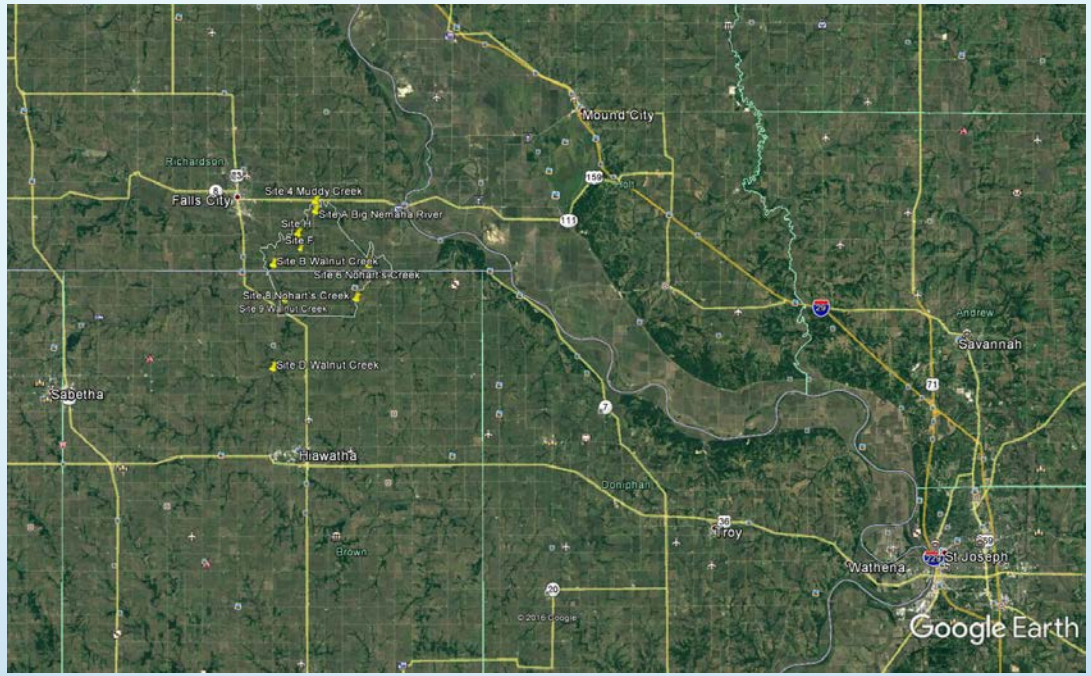
Sac and Fox Nation of Missouri in KS and NE

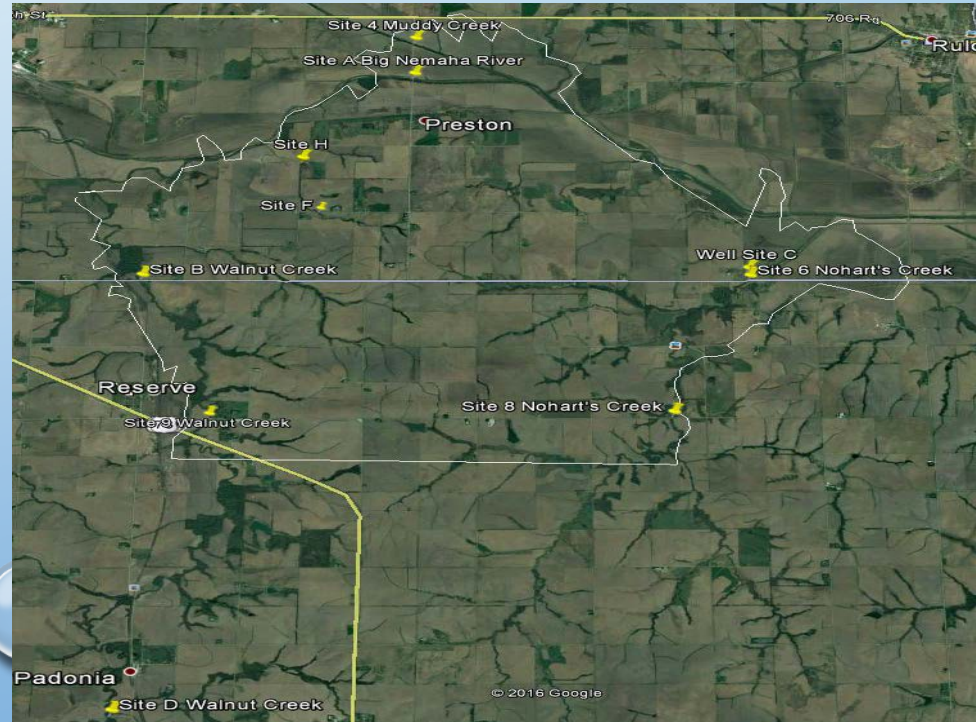
Located 10 Mi. N of Hiawatha KS, 6 mi SE of Falls City, NE

Reservation size: 25 Sq. mi. or 16,000 acres consisting of Row Crop, pasture, forest.

Reserve KS: Tribal offices, museum and community building, Yellow Earth Housing

Watersheds:
Nohart's Creek
Walnut Creek
Big Nemaha River





ENVIRONMENTAL MONITORING ON THE RESERVATION

- Water Monitoring Program funded through EPA Clean Water Act Section 106- tests surface water for total water quality since 2003
- Air Program funded through EPA Clean Air Act Section 103 Since 2001
- Brownfield/Tribal Response Program Since 2006

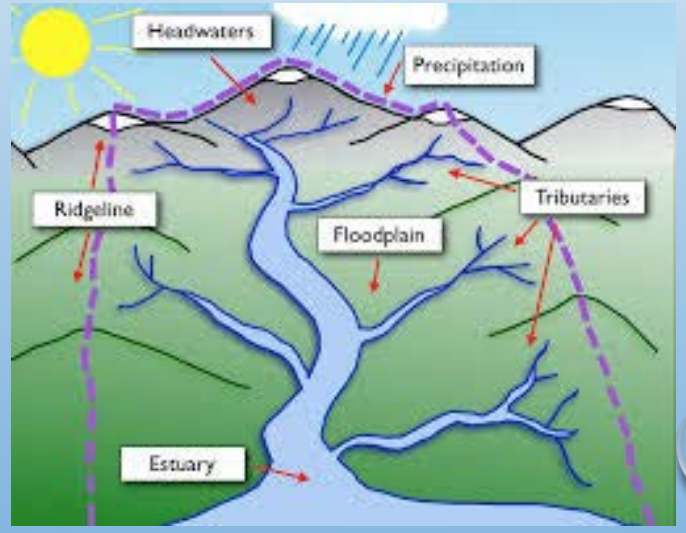
GOALS OF THE WATER PROGRAM

EPA Clean Water Act Section 106:

Protect Water Quality

Fish and shellfish safe to eat

Improve water quality on a watershed basis



SURFACE WATER MONITORING STRATEGY

SURFACE WATER SAMPLING SITES

- BIG NEMAHA RIVER AT 656 AVE.
- MUDDY CREEK AT 656 AVE.
- NOHART'S CREEK AT 320TH, 340TH
- WALNUT CREEK 2 MI. S AND 1 MI S OF RESERVATION, AT 340TH RD

WELLS/SPRINGS/NON-POINT

- WELL AT BUFFALO FARM
- SPRING TO BE DETERMINED
- "CAFO" AT 655 AND 704 RD

SURFACE WATER MONITORING SITES

BIG NEMAHA RIVER

Possible source of drinking water for a surface water treatment plant

Popular fishing spot

Concerns: E. Coli and sedimentation

WALNUT CREEK

Listed as impaired water by

State of Kansas for:

E. Coli

Phosphorous

Total suspended solids

Atrazine

NOHART'S CREEK

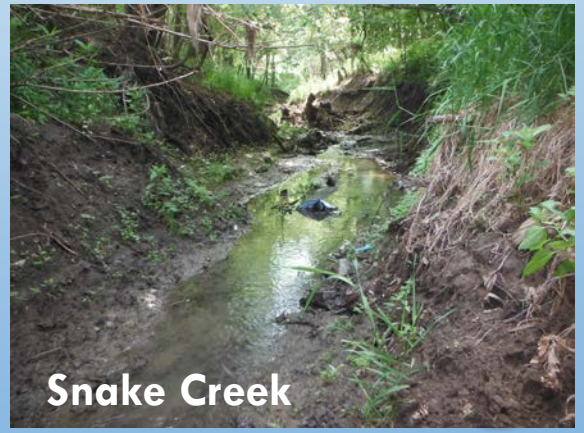
Popular fishing spot

Concerns: E. coli and Sedimentation

WATER QUALITY OBSERVATIONS

Water quality on the reservation is impacted by the following:

- Pesticide and Nutrient usage
- Runoff from crop and livestock farms
- Excess sedimentation caused by erosion of land

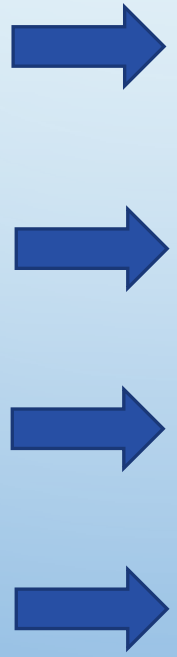


Snake Creek

WATER QUALITY IMPACTS

WATER QUALITY AFFECTED BY:

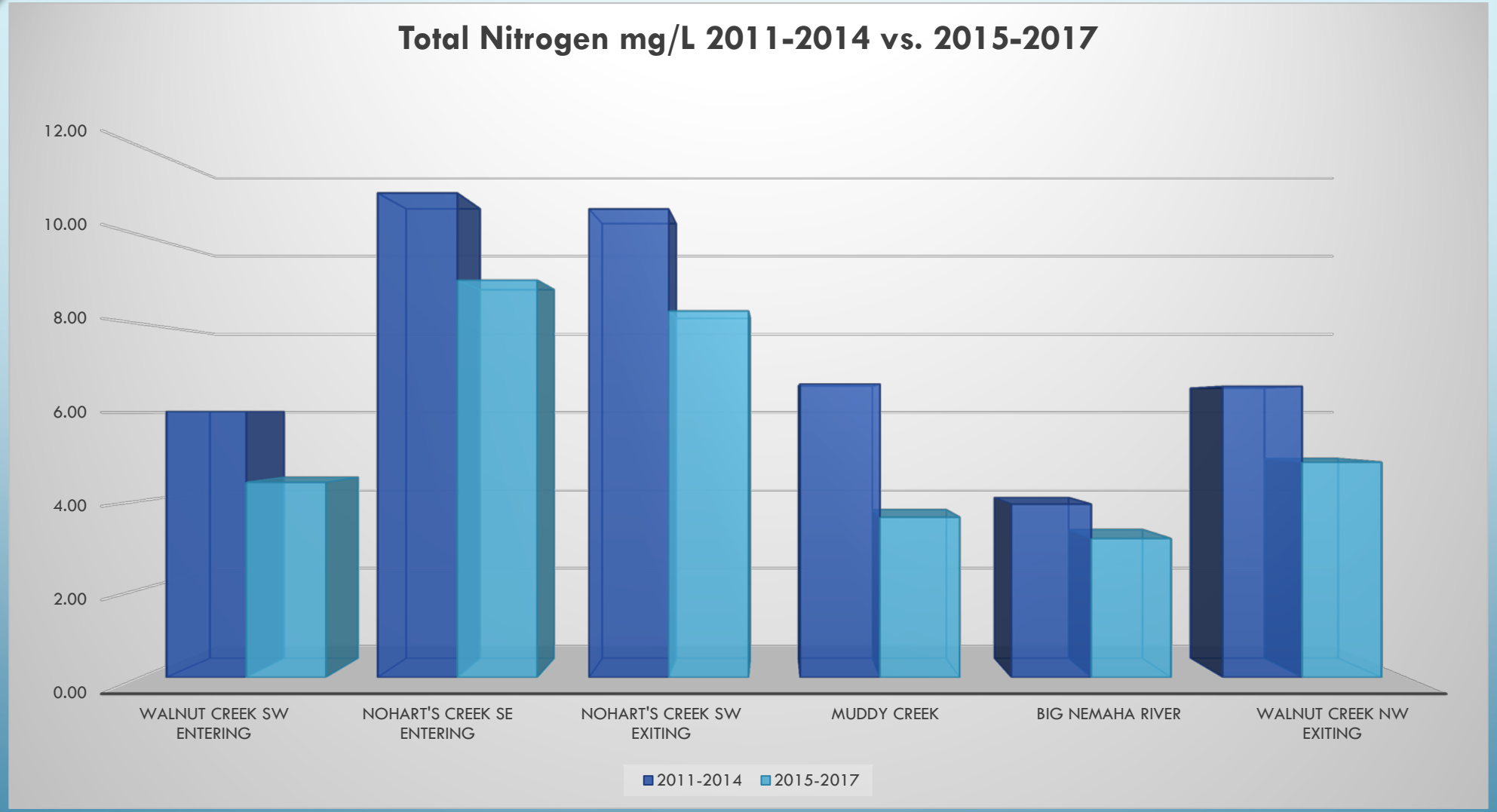
- PESTICIDES: ATRAZINE AND METOLACHLOR (DUAL) WIDELY USED
- NUTRIENTS: EXCESS NITROGEN AND PHOSPHORUS
- SEDIMENTATION: EROSION OF LANDS NEAR CREEKS/RIVERS
- E. COLI



EFFECTS ON WILDLIFE AND HUMANS

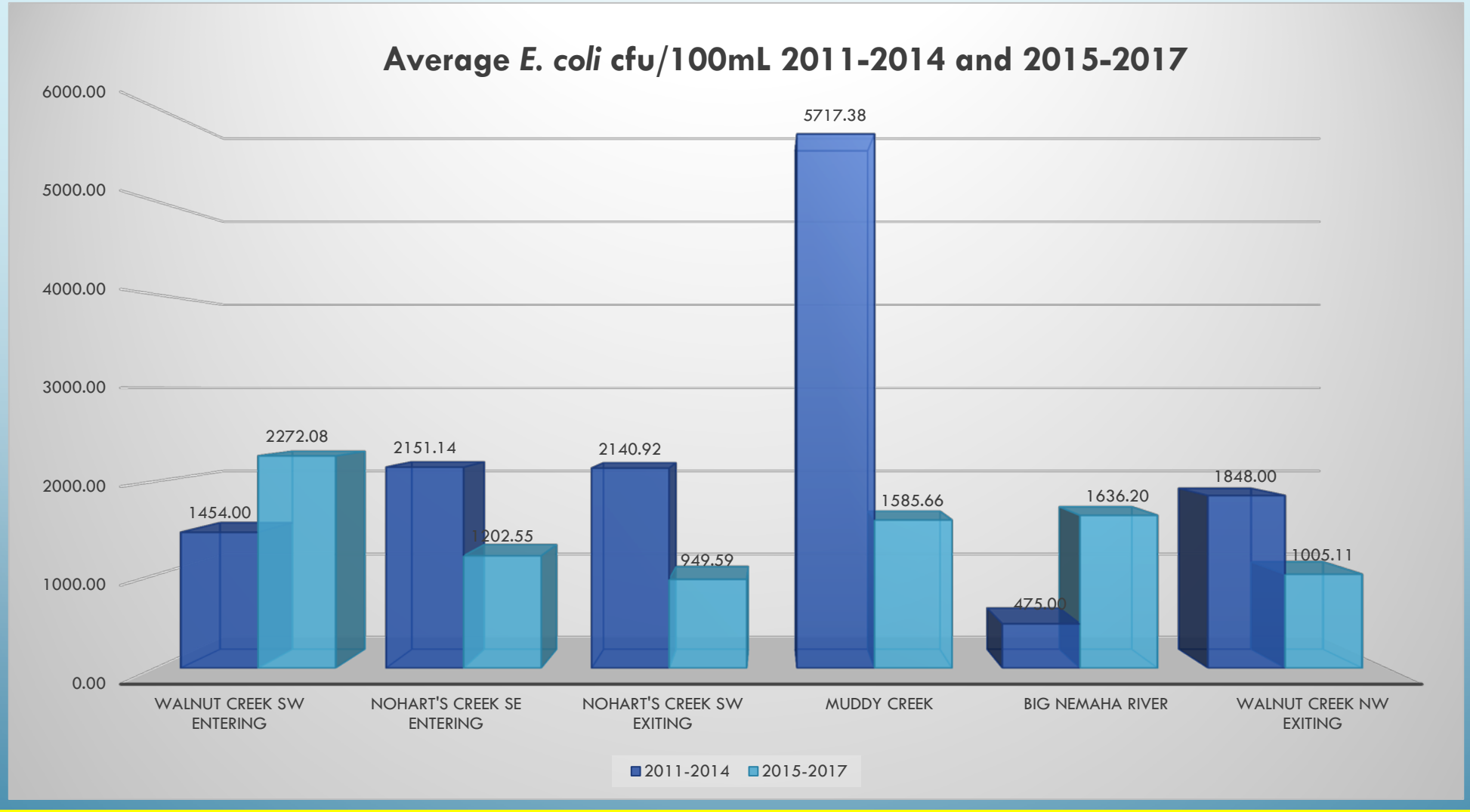
- REPRODUCTIVE ISSUES FOR ANIMALS AND HUMANS
- BLUE BABY SYNDROME, CANCER RISK FOR YOUNG, ELDERLY AND THOSE SICK
- LESSER QUALITY FISH AVAILABLE FOR FOOD
- STOMACH AND DIGESTIVE ISSUES

Sac and Fox Nation Water Quality Assessment



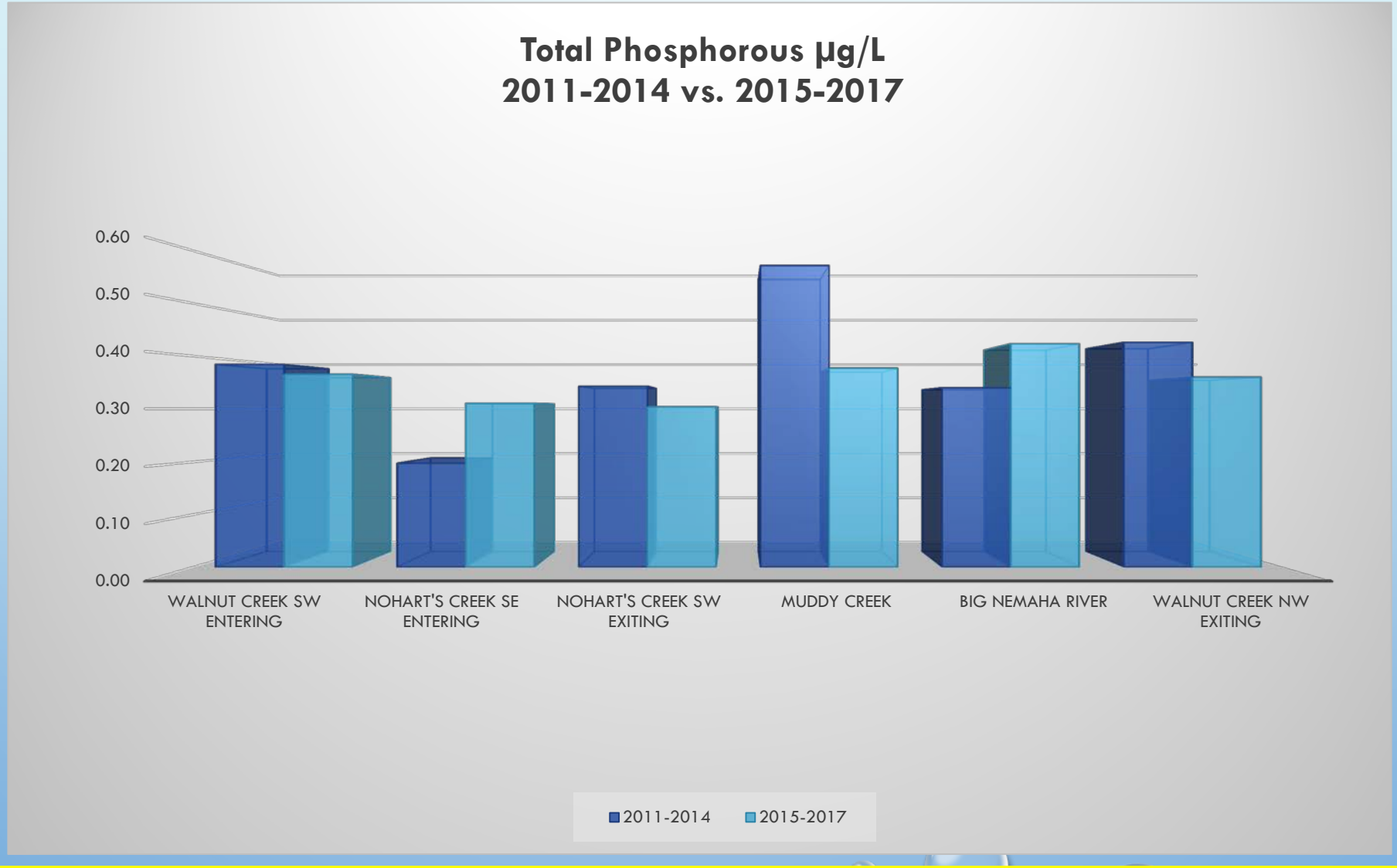
Total Nitrogen threshold = 2.18 mg/L. All sites have excess nitrogen: 1.89 mg/L avg reduction

Sac and Fox Nation Water Quality Assessment



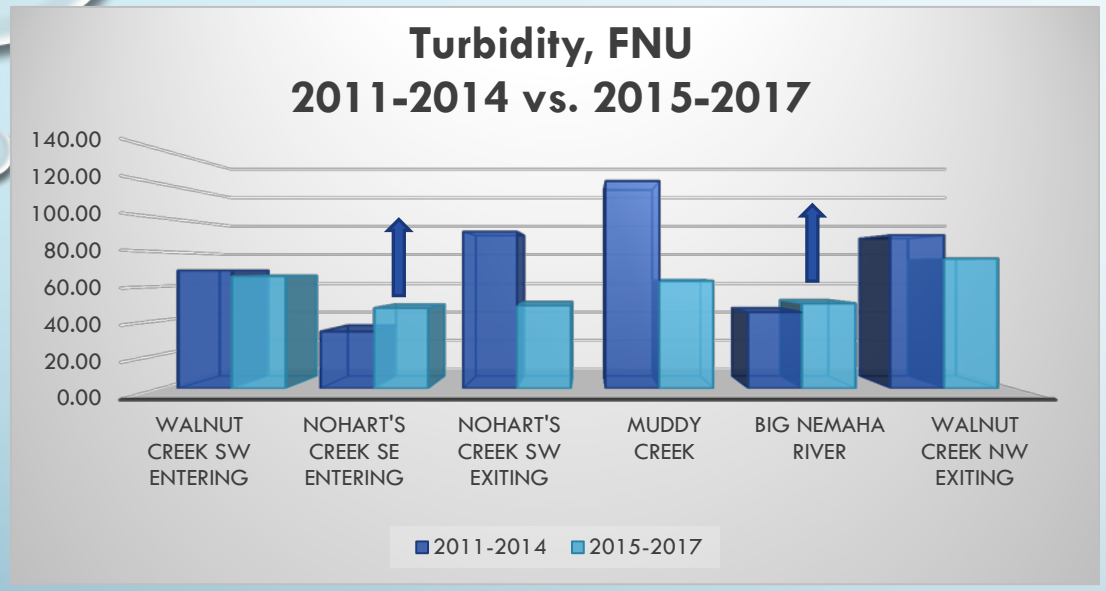
All sites impacted regularly by high E. coli levels. Threshold = 235 cfu (single sample).

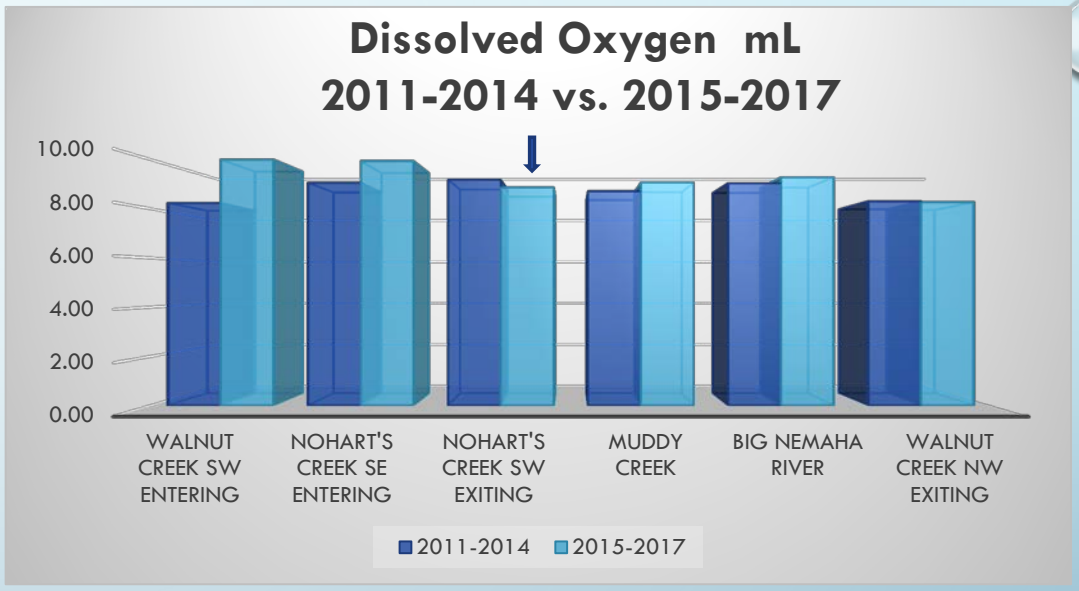
Sac and Fox Nation Water Quality Assessment

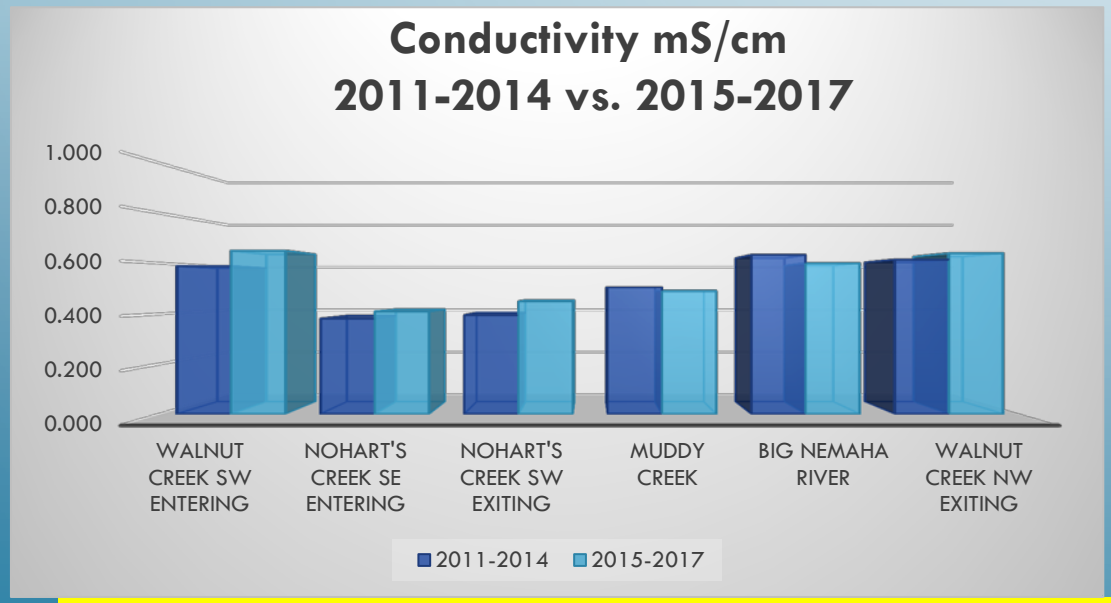


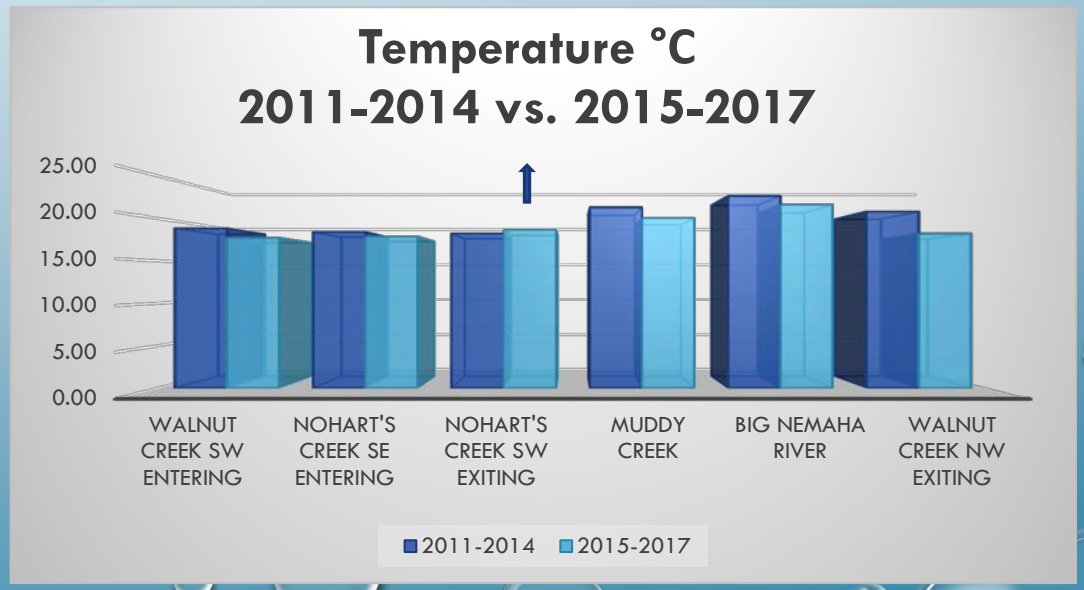
Phosphorous threshold = 76.25 µg/L All Sites impacted by excess phosphorus.

Sac and Fox Nation Water Quality Assessment



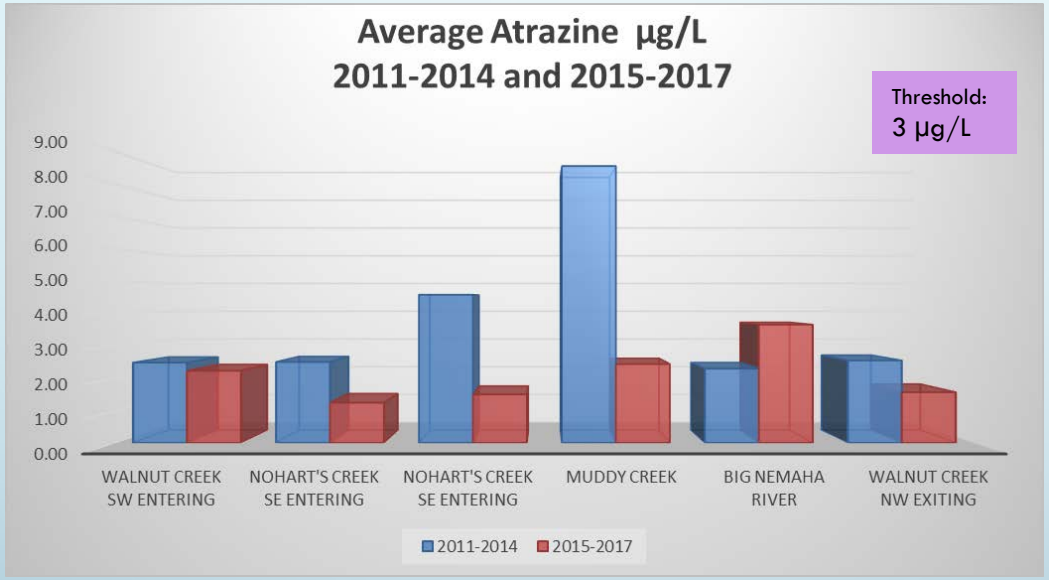


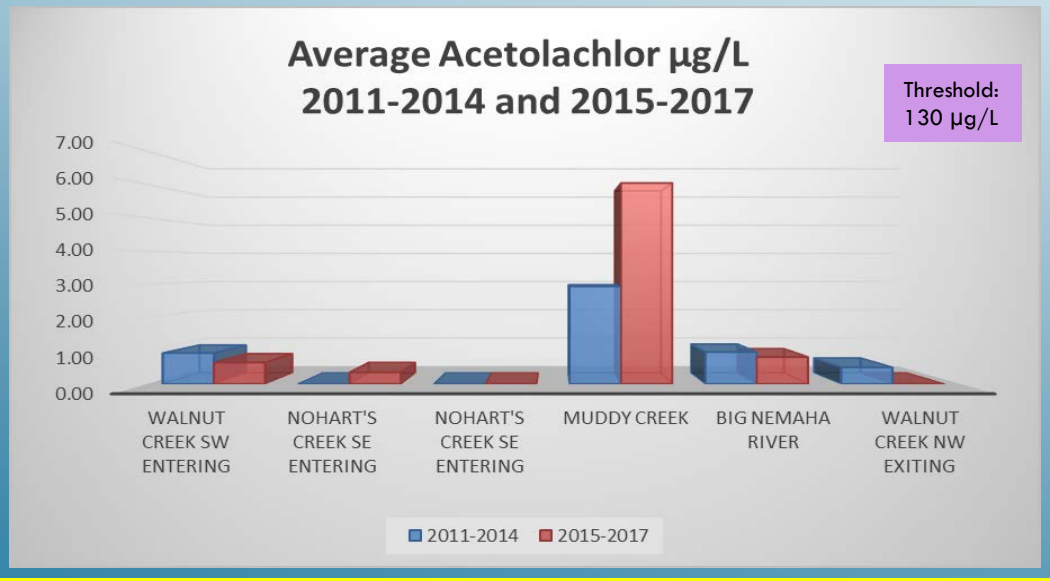


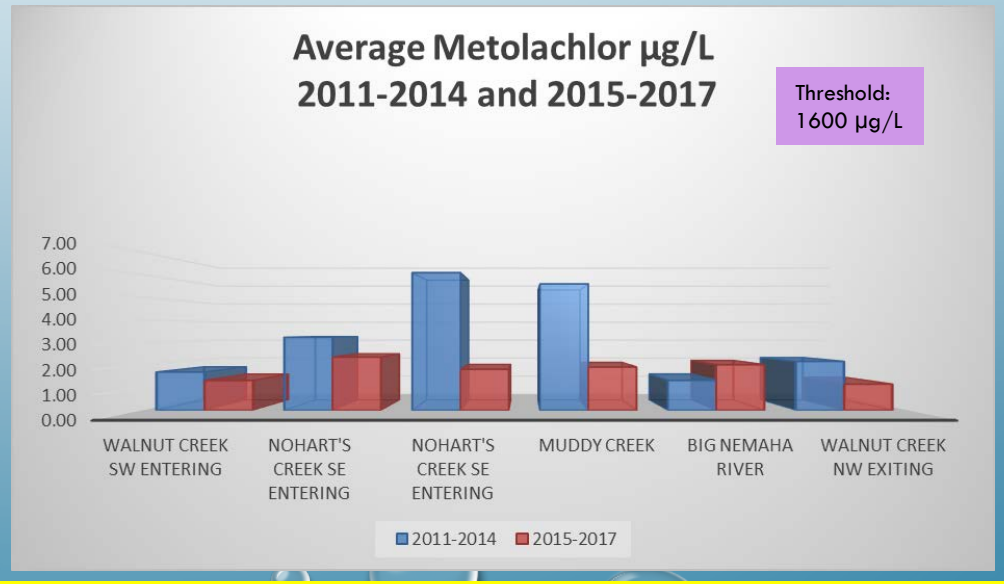


Turbidity lower at most sites, D.O increasing, Conductivity stable, Temp avg. decrease 1degree C

Sac and Fox Nation Water Quality Assessment 2011-2014 vs. 2015-2017
Pesticides







Pesticide monitoring occurs April-June. Community is concerned about crop dusting. Atrazine exceeds thresholds at times.

WHAT ARE OUR WATER PRIORITIES?

SURFACE WATER:

"CAFO" SITE NEEDS BMP'S

E. COLI LEVELS TOO HIGH

PESTICIDES-PRESENCE AT LOW LEVELS

STREAMBANK STABILIZATION- BIG NEMAHA

WETLANDS

DRINKING WATER:

TRIBAL MEMBERS WANT IMPROVED WATER QUALITY

SECONDARY CONNECTION TO PWWD #27

RED EARTH: CONSECUTIVE SYSTEM WITH RICHARDSON CO RWD #2: VERY LOW NITRATES, DBP'S REDUCED

NEED NEW METERS: DISCREPANCIES IN WATER USE.

YELLOW EARTH: BROWN CO RWD #1 HAS HIGH NITRATES. USE OF BOTTLED WATER TYPICAL IN HOMES, OFFICES

Nohart's Creek at 320th Rd.
Cut Banks add excess sediment to creek, reducing water quality downstream.

SURFACE WATER MONITORING STRATEGY: WHAT SHOULD WE TEST FOR AND WHEN?

BI-WEEKLY

Using field meters and equipment:

Dissolved oxygen

Turbidity- Total Dissolved Solids

Conductivity

Ph

Flow rate

Depth

Lab Analysis:

Nutrients- nitrogen and phosphorous

E. Coli bacteria

ONCE PER SEASON

"VOC" Analysis at each site

Drinking Water Analysis at each site

Test buffalo farm well

Test spring locations

Test tap water (office, housing, et.)

TARGET ANALYSIS

Pesticides- atrazine, alachlor, metolachlor, acetochlor will be tested at each site once in April, July, August and September.

ADDITIONAL TESTS FOR

Wells

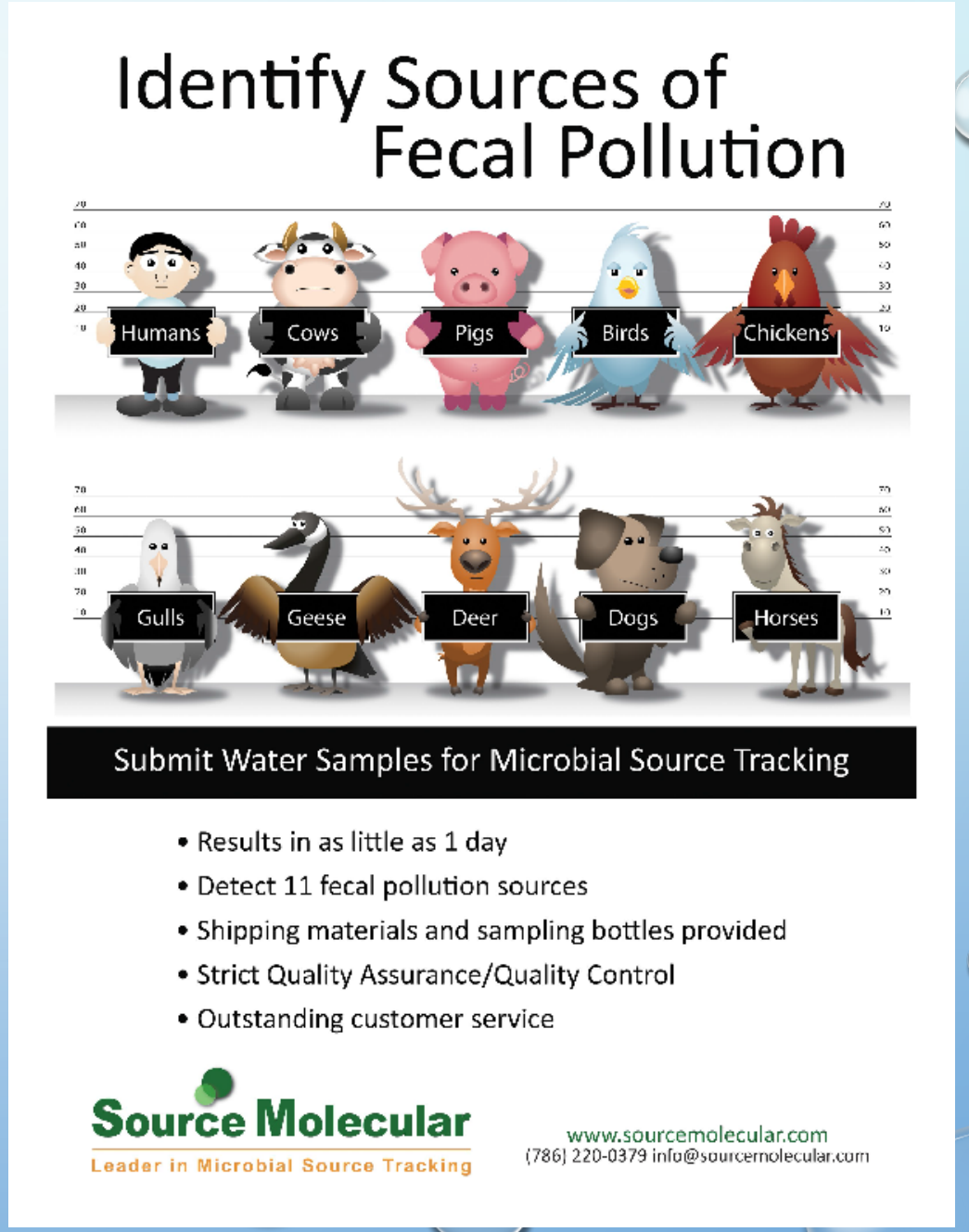
Tap

ADDITIONAL TESTING FOR BACTERIA

Walnut creek- impaired water 303 (d) list state of KS

Test determined the source of fecal bacteria

Cow, human, etc.



HOW DO WE IMPROVE WATER QUALITY ? ADOPT STANDARDS!

KANSAS SURFACE WATER QUALITY STANDARDS 12/2004

SIMILAR TO EPA WATER QUALITY STANDARDS, USUALLY MORE STRICT

KANSAS DEPT. OF HEALTH AND ENVIRONMENT

EPA WATER QUALITY STANDARDS

CLEAN WATER ACT (2006)

SINGLE SOURCE FOR STANDARDS

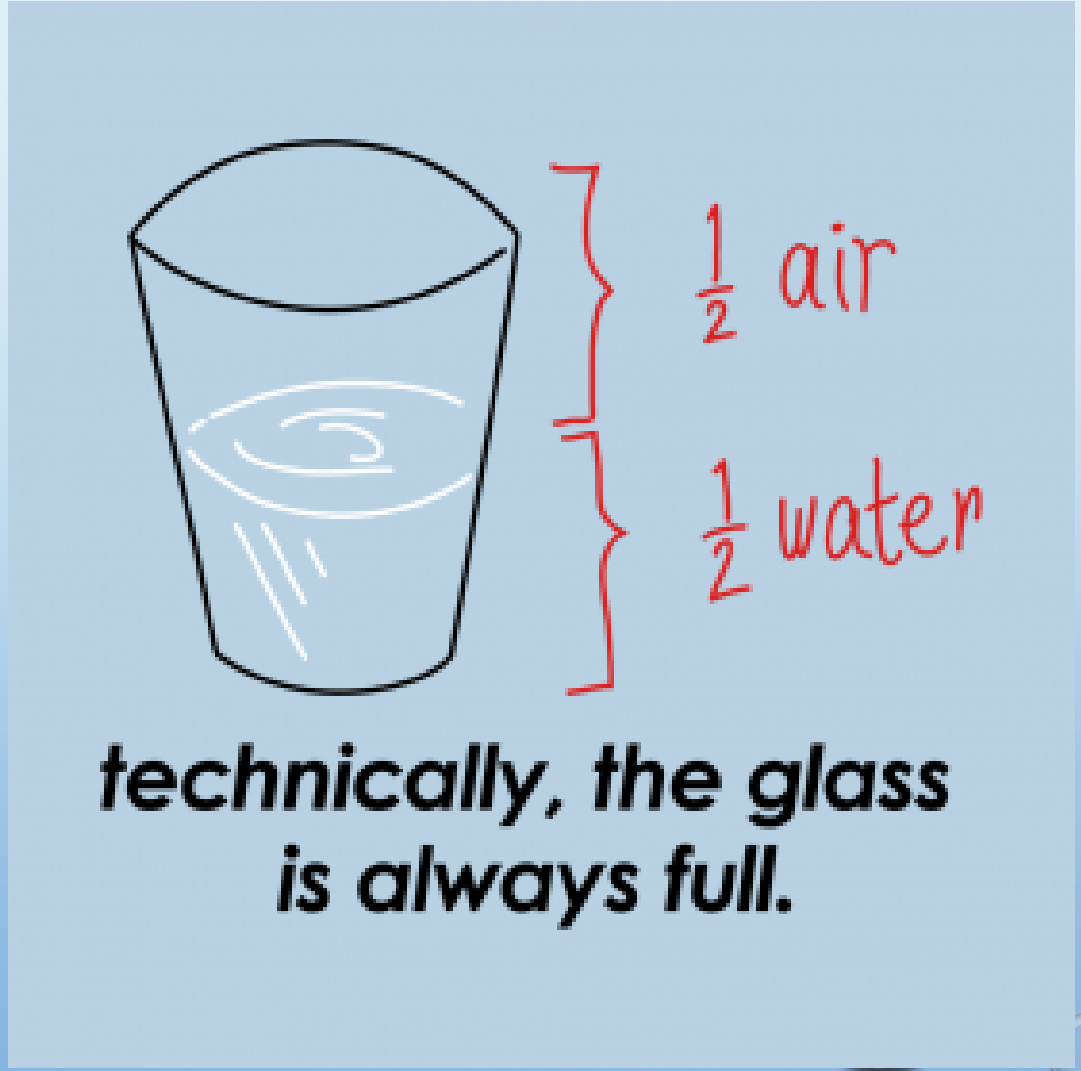
CAN BE USED IN NEBRASKA AND KANSAS

Adopting water quality standards does not require you to enforce or collect fines from those who pollute the water

NEBRASKA WATER QUALITY STANDARDS 06/2012

SIMILAR TO EPA WATER QUALITY STANDARDS, USUALLY MORE STRICT

NEBRASKA DEPT. OF ENVIRONMENTAL QUALITY

NEBRASKA WATERWAYS

Thank You!