Agriculture and Water Quality Workshop
Panel Discussion
University of Kansas
April 15, 2011

Our Vision – Healthy Kansans Living in Safe and Sustainable Environments
The Flavors of Eutrophication

Edward Carney
Environmental Scientist
Bureau of Environmental Field Services
Lake and Wetland Program

Our Vision – Healthy Kansans Living in Safe and Sustainable Environments
Cultural vs. Natural

- Eutrophication is a natural process
- Too often accelerated by cultural inputs
- Too often this leads to these arguments:
  1) “If it’s natural they all will become green anyway, so why should we have to change what we do?”
  2) “If it’s natural we should not have to do anything.”
My Patented ‘Ice Cream’ Analogy

- Look at **background eutrophication** as a plain ice cream cone
- **Cultural eutrophication** can be viewed as “toppings” added on
- One could argue that a few toppings add value to the cone, for some beneficial uses
- But two pounds of toppings per cone?!!
Comparing The Human Component to Simple Aging

- A couple years ago we conducted an analysis to answer the question for Kansas lakes
  - Is natural, or background, eutrophication significant?
  - Or, is it really the inputs from human activity that impact water quality?
Compiled a list of 120+ lakes that had all the parameters we wished to examine.

From those 120+ we parsed out four groups (44 lakes total) based on lake age and watershed condition.
Groups were adjusted to match each other for physical traits and basic physicochemical features to the degree possible.
Groups were then examined for trophic state parameters:

Stressor variables: Total Phosphorus and Total Nitrogen showed a very marked trend
Response variables showed the same trend:

Chlorophyll-a and Secchi Disk Depth
And…. The same trend extended to other trophic state/biological characteristics

Algal Community Composition and Macrophyte Community Structure
General Conclusions

- Eutrophication may be a natural process, BUT...
  - Cultural augmentations clearly outweigh background inputs by many-fold
  - Even for artificial Midwest lakes, background eutrophication rates appear very low/slow
- The watershed is where the impact lies
- The good news is that we can control what happens in watersheds if we choose
Our Vision – Healthy Kansans Living in Safe and Sustainable Environments

Ed Carney, Lake and Wetland Program
KDHE Bureau of Environmental Field Services
1000 SW Jackson, Topeka, KS 66612
ecarney@kdheks.gov (785-296-5575)
http://kdheks.gov/befs/lakes_monitoring.htm