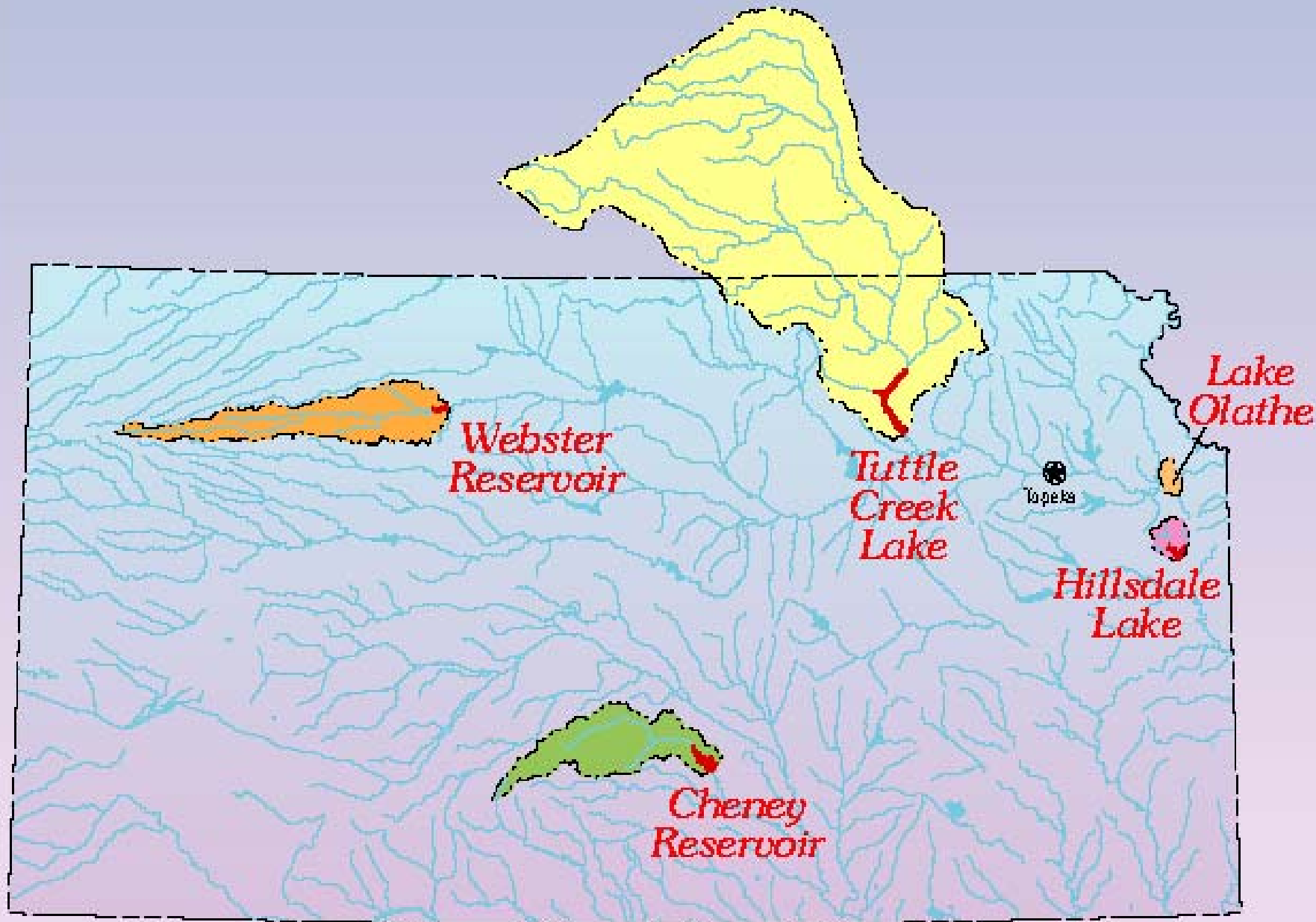


THE IMPACT OF SEDIMENTATION ON WATER QUALITY IN KANSAS RESERVOIRS

David Mau
U.S. Geological Survey



WHY USE RESERVOIR SEDIMENTS?

- Historical water-quality data are almost universally absent or insufficient
- Results from sediment studies can be used to provide estimates of rates of sedimentation and loading of phosphorus and other constituents
- Results from sediment studies can help document contamination sources and progress made toward cleaner water

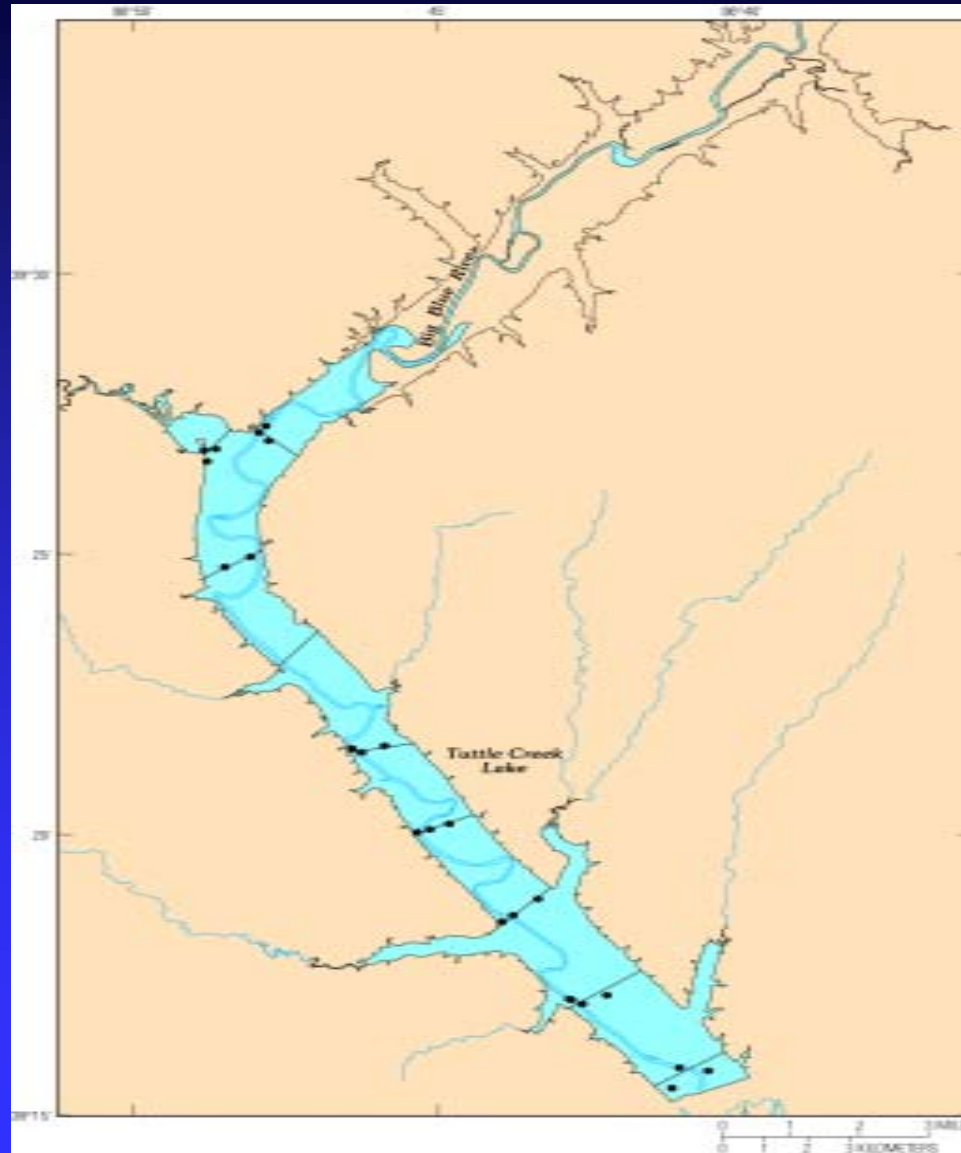
WHY USE RESERVOIR SEDIMENTS?

- Results from sediment studies may be used by government agencies to evaluate the effects of contaminant sources on TMDL's
- Sediment studies can be used to reconstruct historical trends to evaluate BMP's

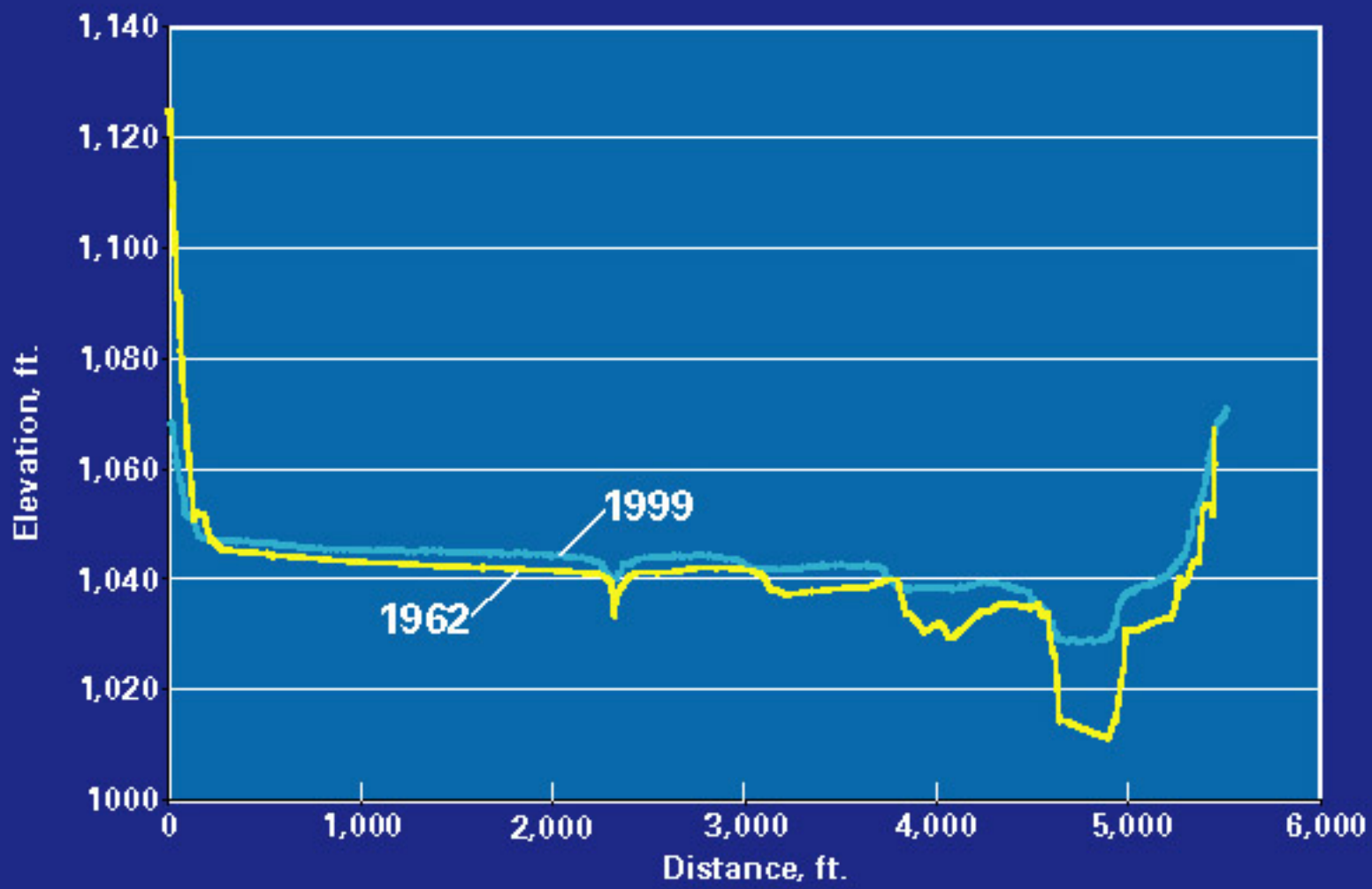
■ OBJECTIVES

- ◆ Describe sediment and phosphorus yields
- ◆ Identify probable causes for differences in sediment and phosphorus yields among the six reservoirs

Tuttle Creek Lake

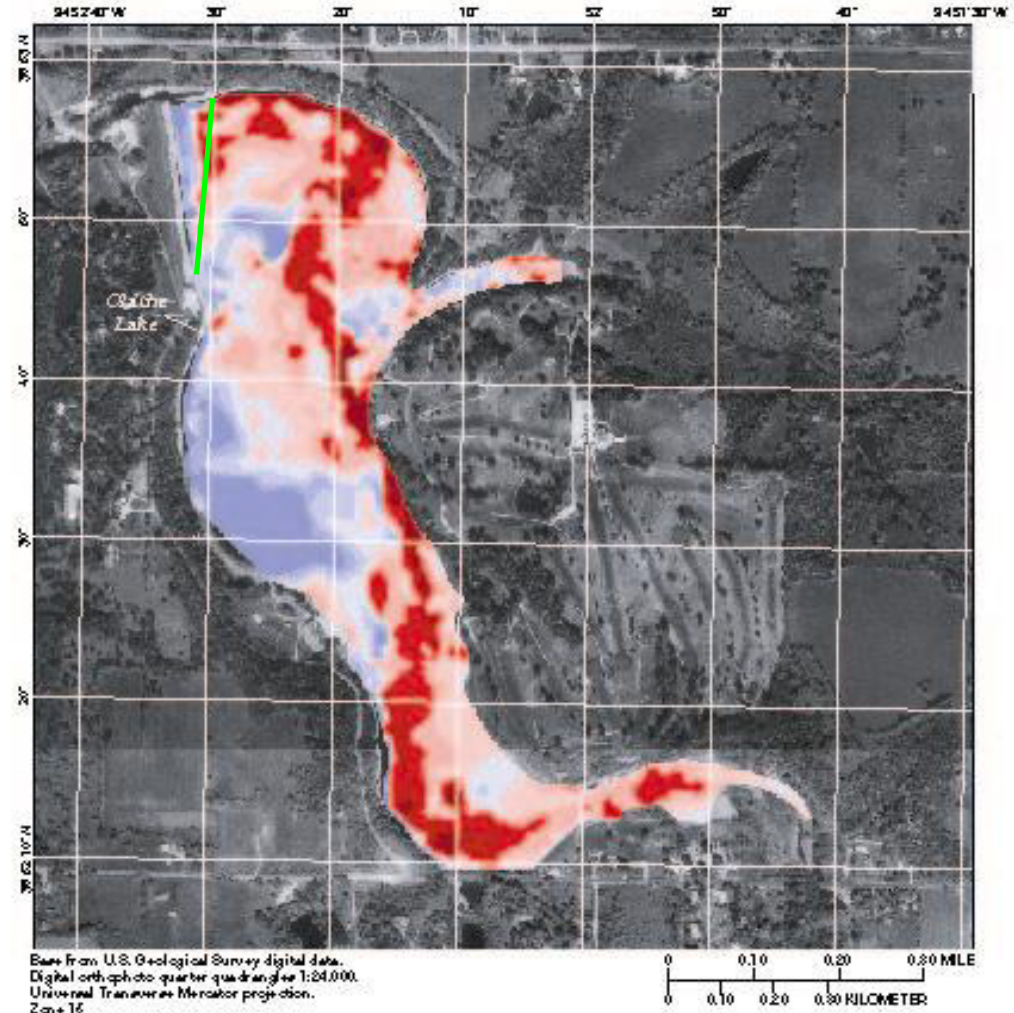






Lake Olathe Depth of Sedimentation: 1956-2000

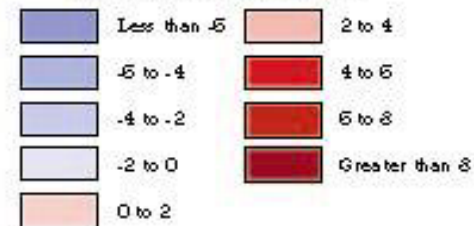
- 320 acre-feet of deposition (10 percent)
- 7 acre-feet/year

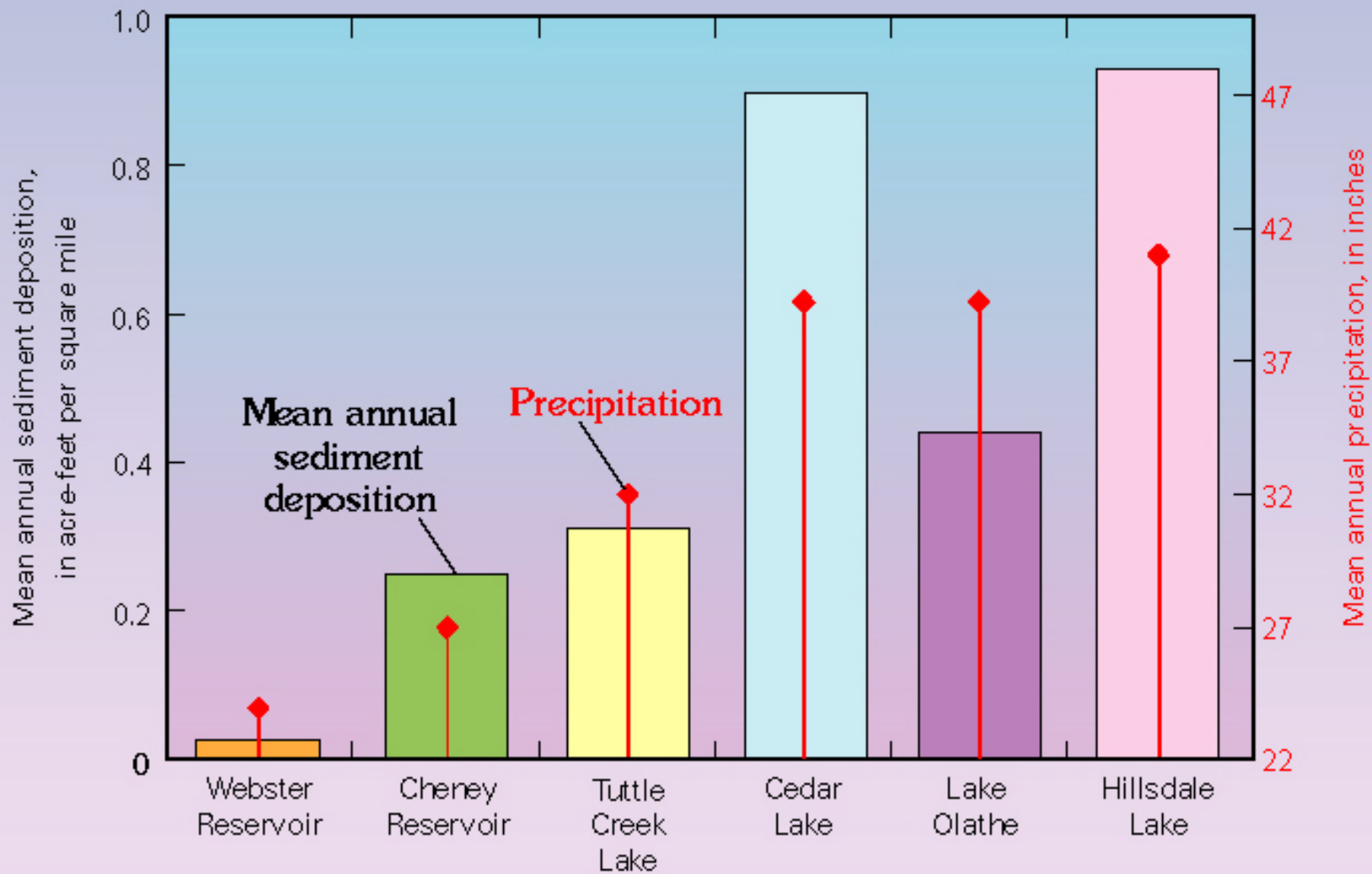


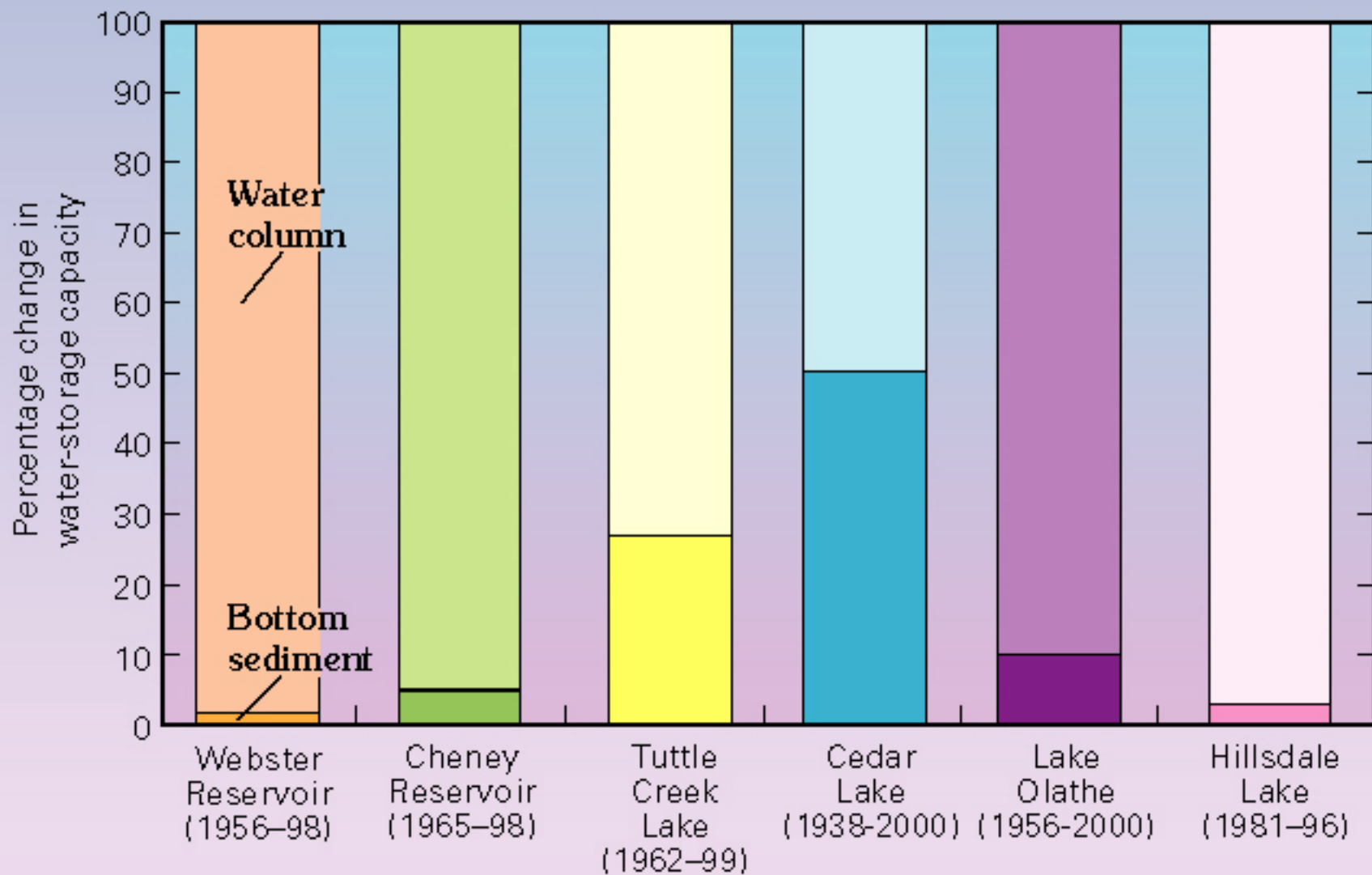
Range line

EXPLANATION

Sedimentation estimates in feet



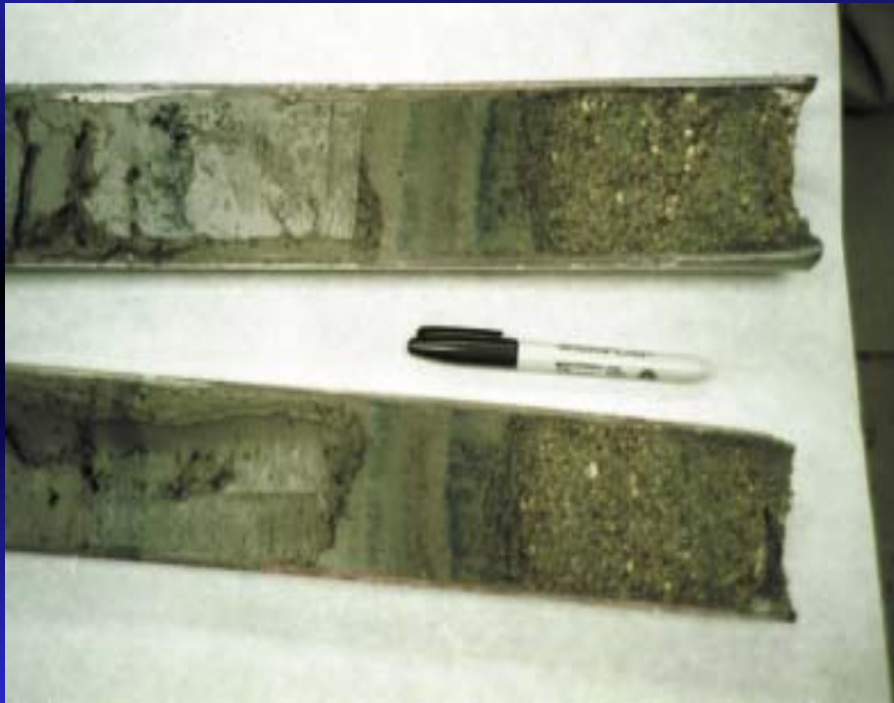








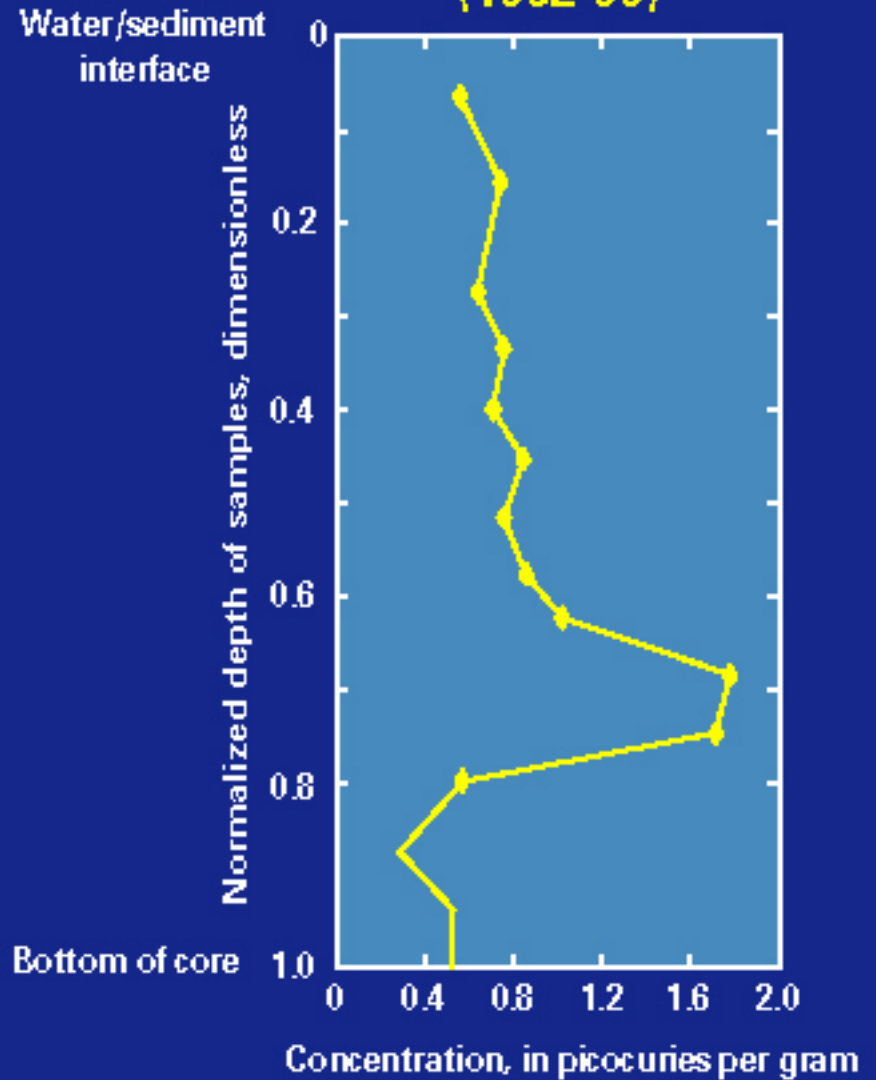
Reservoir Sediment Core

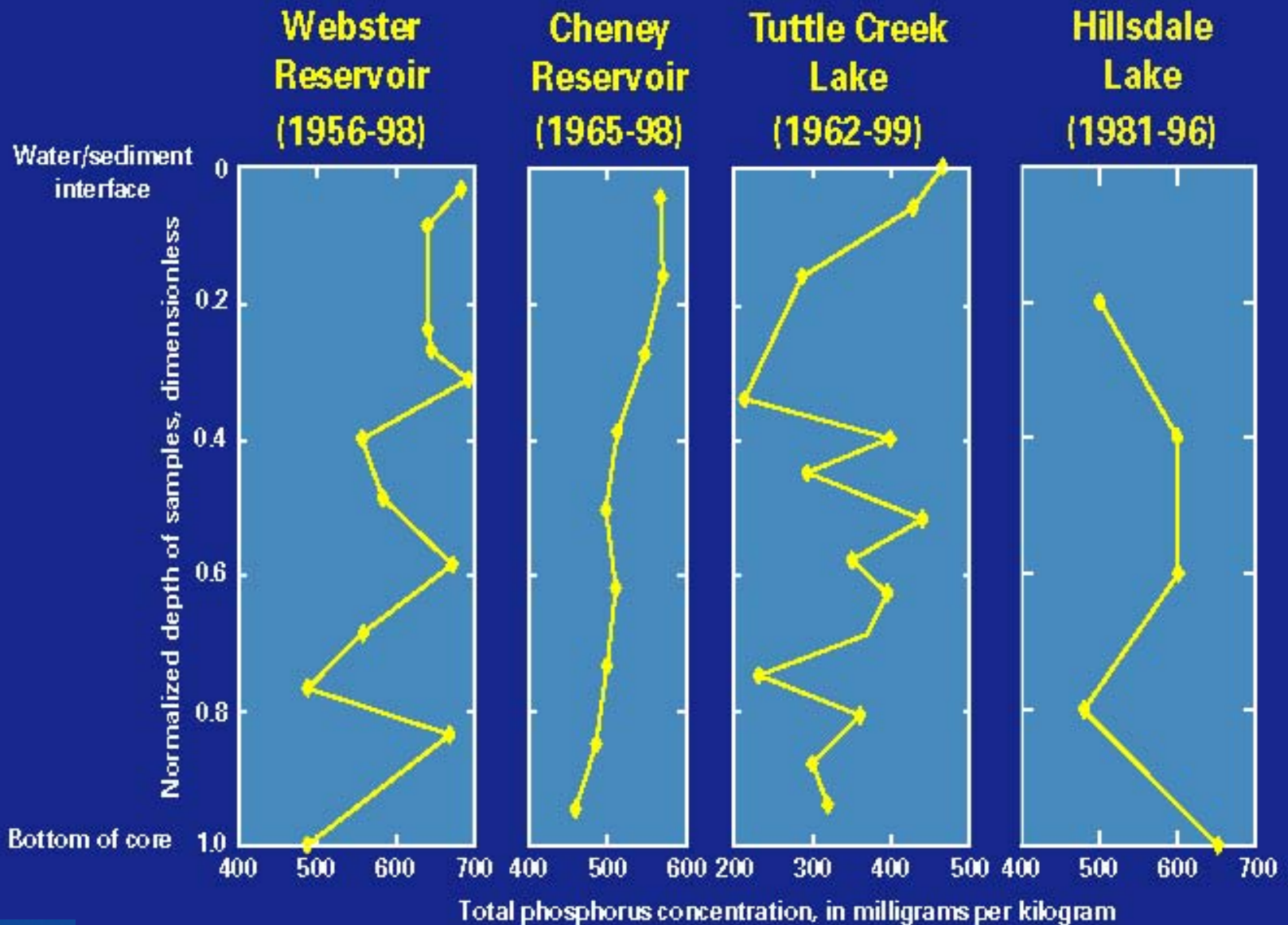


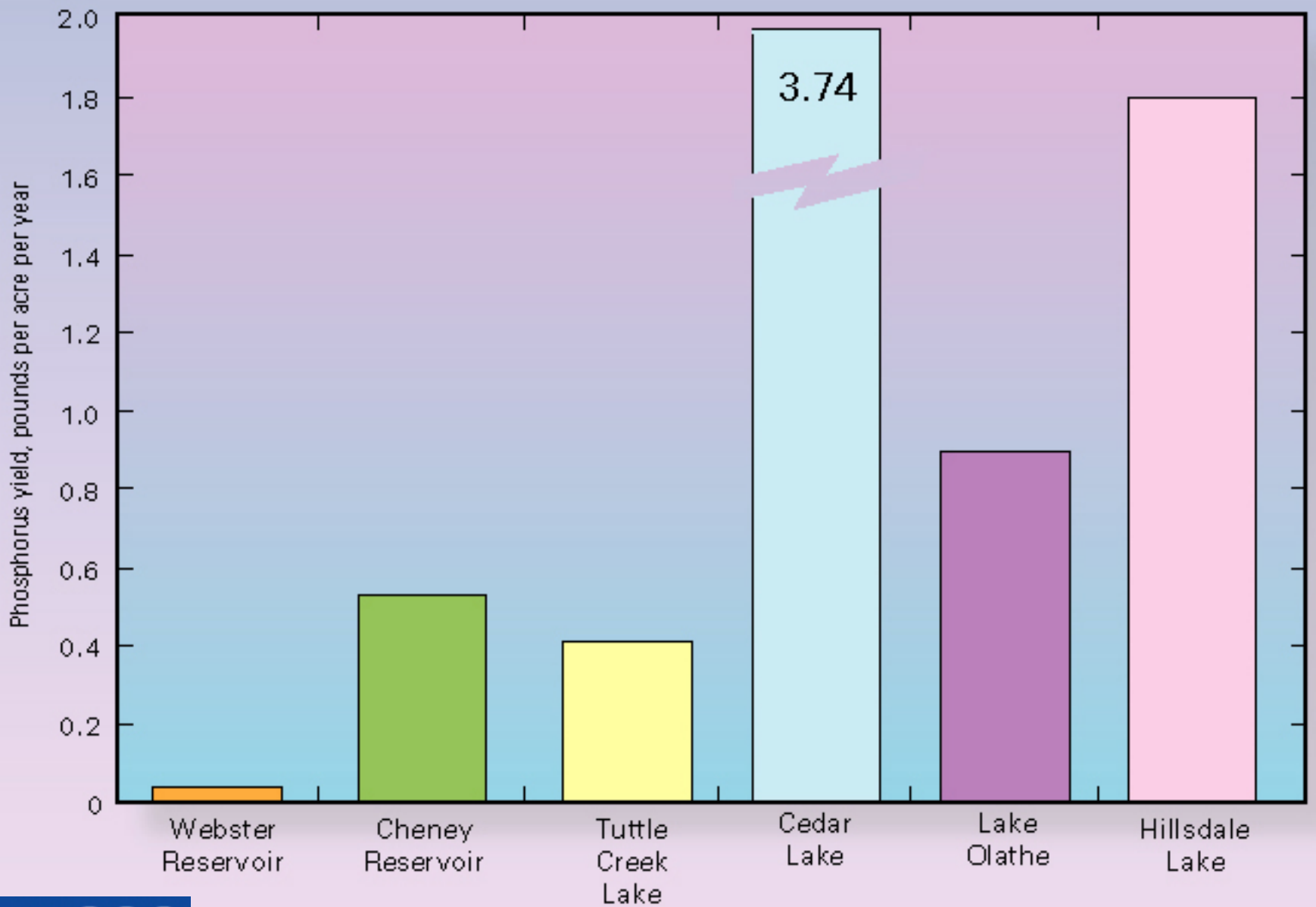
- Reservoir sediments integrate activities in watershed
- Chemical trends can be identified from sediments
- Sediment and chemical loads determined from cores

Cesium-137

Tuttle Creek Lake (1962-99)







Total phosphorus loads and yields for selected reservoirs in Kansas

Site	Period, yr	Total sediment deposition million lb	Mean Phosphorus concentration, mg P/kg sed	Mean annual phosphorus loading, lb/yr	Mean annual phosphorus yield, lb/acre/yr
Webster Reservoir	42	3,300	374	29,400	0.04
Cheney Reservoir	34	15,400	480	226,000	0.38
Tuttle Creek Lake	37	194,000	481	2,520,000	0.41
Cedar Lake	62	595	1537	14,700	3.74
Lake Olathe	45	567	774	9,740	0.92
Hillsdale Lake	15	4,000	583	154,000	1.8

CONCLUSIONS

Sediment and phosphorus yields vary greatly among the six reservoirs

No discernible trends for total phosphorus concentration with depth at Webster, Tuttle Creek, Cedar Lake, Lake Olathe, or Hillsdale

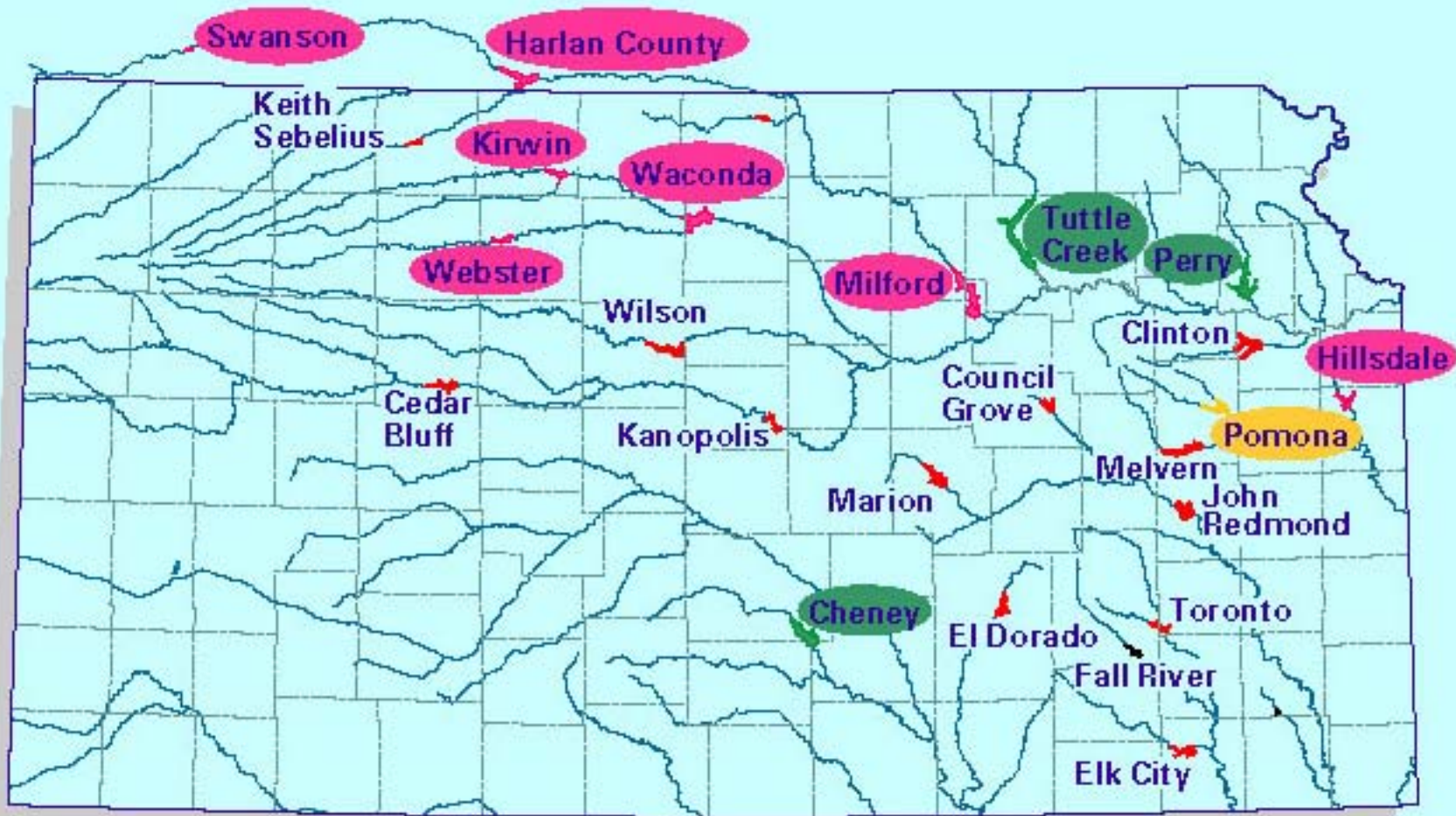
Topography and precipitation affect runoff and erosion that lead to increased phosphorus yields

Additional Information

■ Web Page:

- ◆ <http://ks.water.usgs.gov/Kansas/ressed/>
- ◆ <http://ks.water.usgs.gov/Kansas/qw/olathe>
- ◆ <http://ks.water.usgs.gov/Kansas/rtqw>
- ◆ Real-time water-quality data on web





Completed
 In progress
 Planned