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CEE 577: Surface Water Quality Modeling

Lecture #7
Eutrophication, limiting nutrients and the Mill River

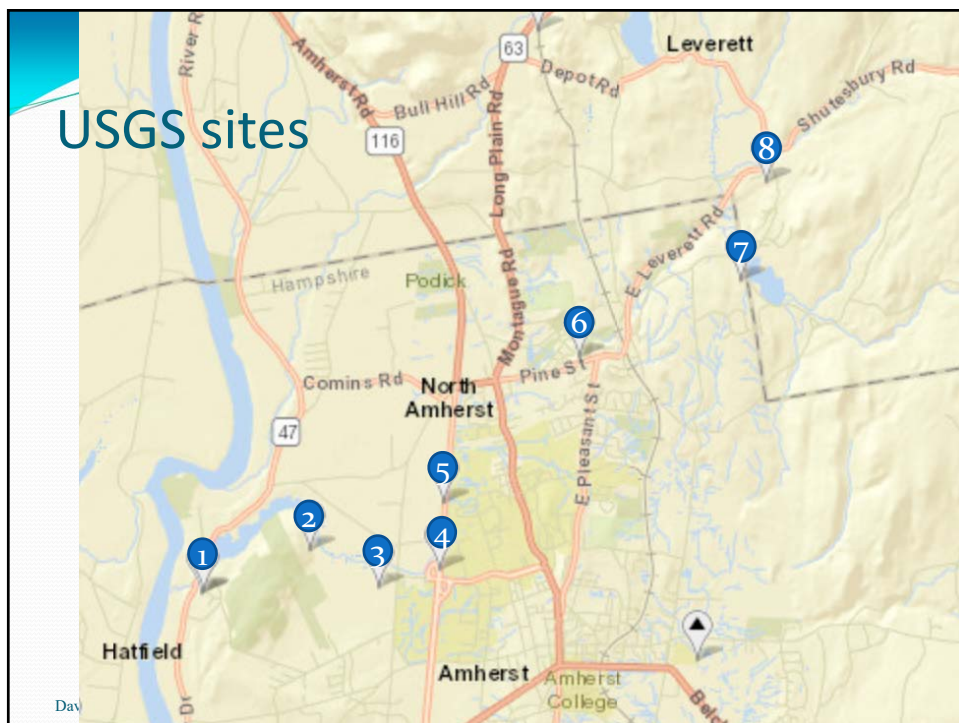
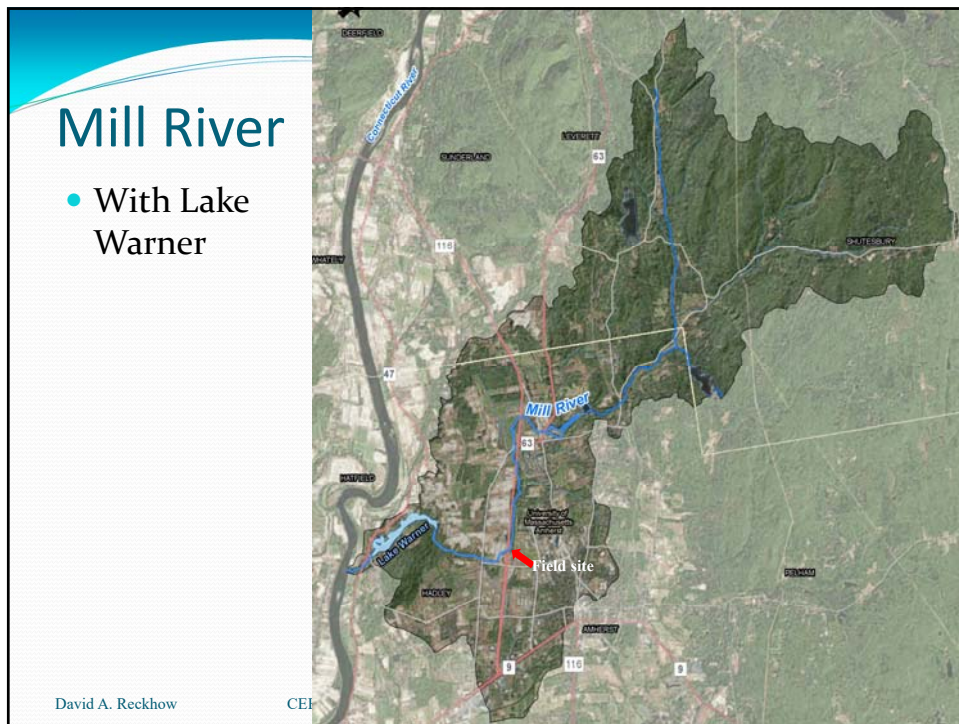
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Cultural Eutrophication

- Many correlated WQ problems
 - Floating mats of algae
 - Low DO
 - High P?



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USGS site data

#	Description	USGS Number	DA (mi ²)	Latitude	Longitude	Information
1a	Mill River at N. Hadley	01170722		42°23'07"	72°34'54"	4 flows (1987)
1b	Mill River at N. Hadley	01170720		42°23'08"	72°34'53"	1 WQ sample (1973)
2	Mill River site 3 near Amherst	01170718		42°23'27"	72°33'46"	No data
3	Mill River site 2 near Amherst (@Mill site road)	01170717		42°23'10"	72°33'03"	2 flows, 1 WQ sample (1987)
4	Mill River site 1 near Amherst (near WWPP)	01170715		42°23'18"	72°32'24"	5 flows (1987)
5	Mill River injection site near Amherst	01170714		42°23'49"	72°32'22"	No data
6	Cushman Brook at N. Amherst	01170710	15.4	42°24'57"	72°30'57"	2 flows (1938, 1965)
7	Atkins Reservoir	422532072291501		42°25'32"	72°29'15"	No data
8	Roaring Brook at E. Leverett	01170700	7.28	42°26'18"	72°28'59"	7 flows and 3 WQ samples (1971-1973)

Lake Nutrient Classification

Phosphorus Conc. (mg/L)	Trophic State	Lake Use
<0.010	Oligotrophic	Suitable for water-based recreation and propagation of cold water fisheries, such as trout. Very high clarity and aesthetically pleasing. Excellent as a drinking water source.
0.010 - 0.020	Mesotrophic	Suitable for water-based recreation but often not for cold water fisheries. Clarity less than oligotrophic lake.
0.020 - 0.050	Eutrophic	Reduction in aesthetic properties diminishes overall enjoyment from body contact recreation. Generally very productive for warm water fisheries. High TOC and algal tastes & odors make these waters less desirable as a water supply.
> 0.050	Hyper-eutrophic	A typical "old-aged" lake in advanced succession. Some fisheries, but high levels of sedimentation and algae or macrophyte growth may be diminishing open water surface area. Generally, unsuitable for drinking water supply.



- To next lecture

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