MAINE VOLUNTEER LAKE MONITORING PROGRAM

• 24 MAPLE HILL ROAD, AUBURN ME 04210, (207) 783-7733 •

Volunteers Keeping A Watchful Eye on the Health of Maine Lakes and Ponds for 39 Years!
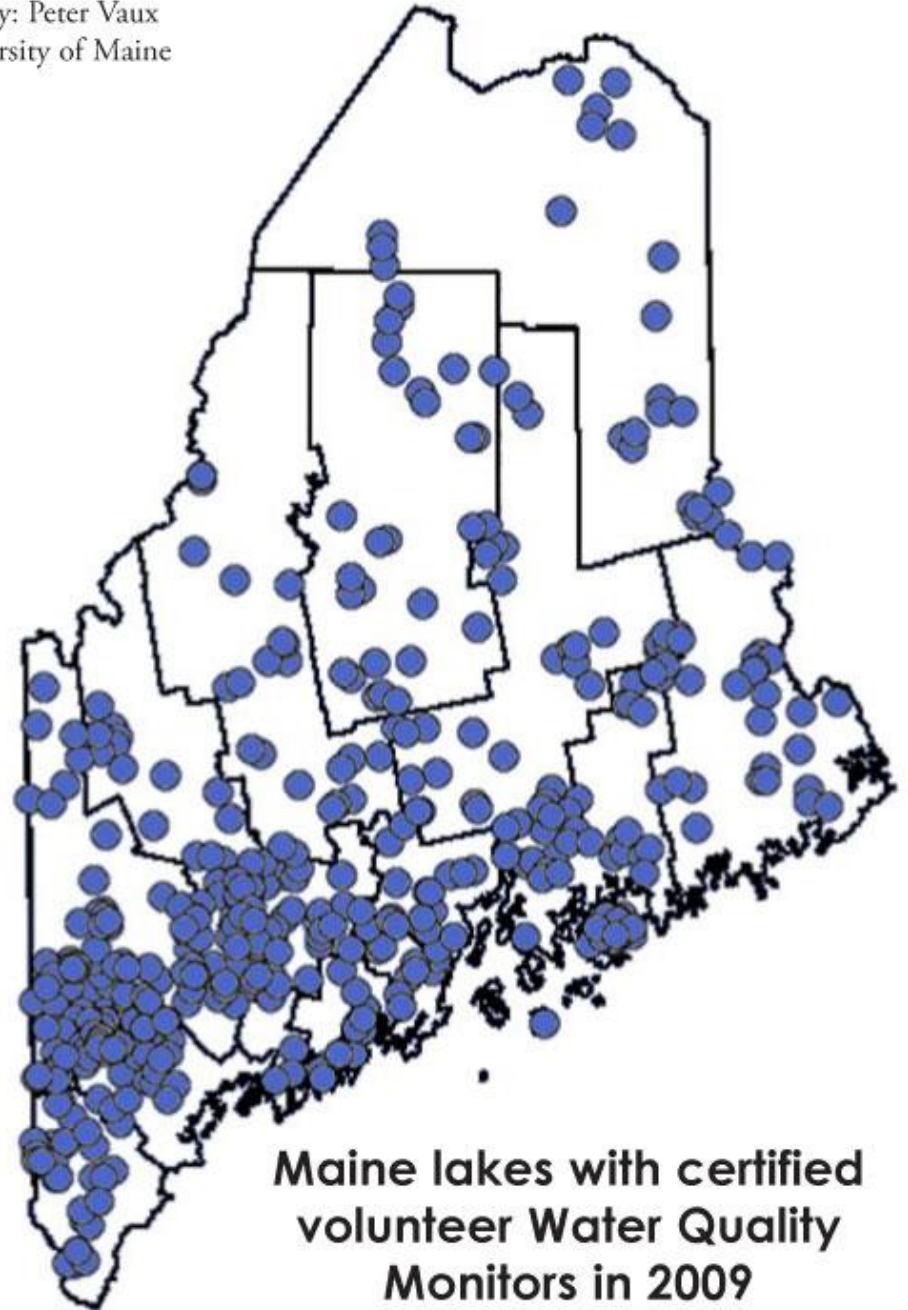
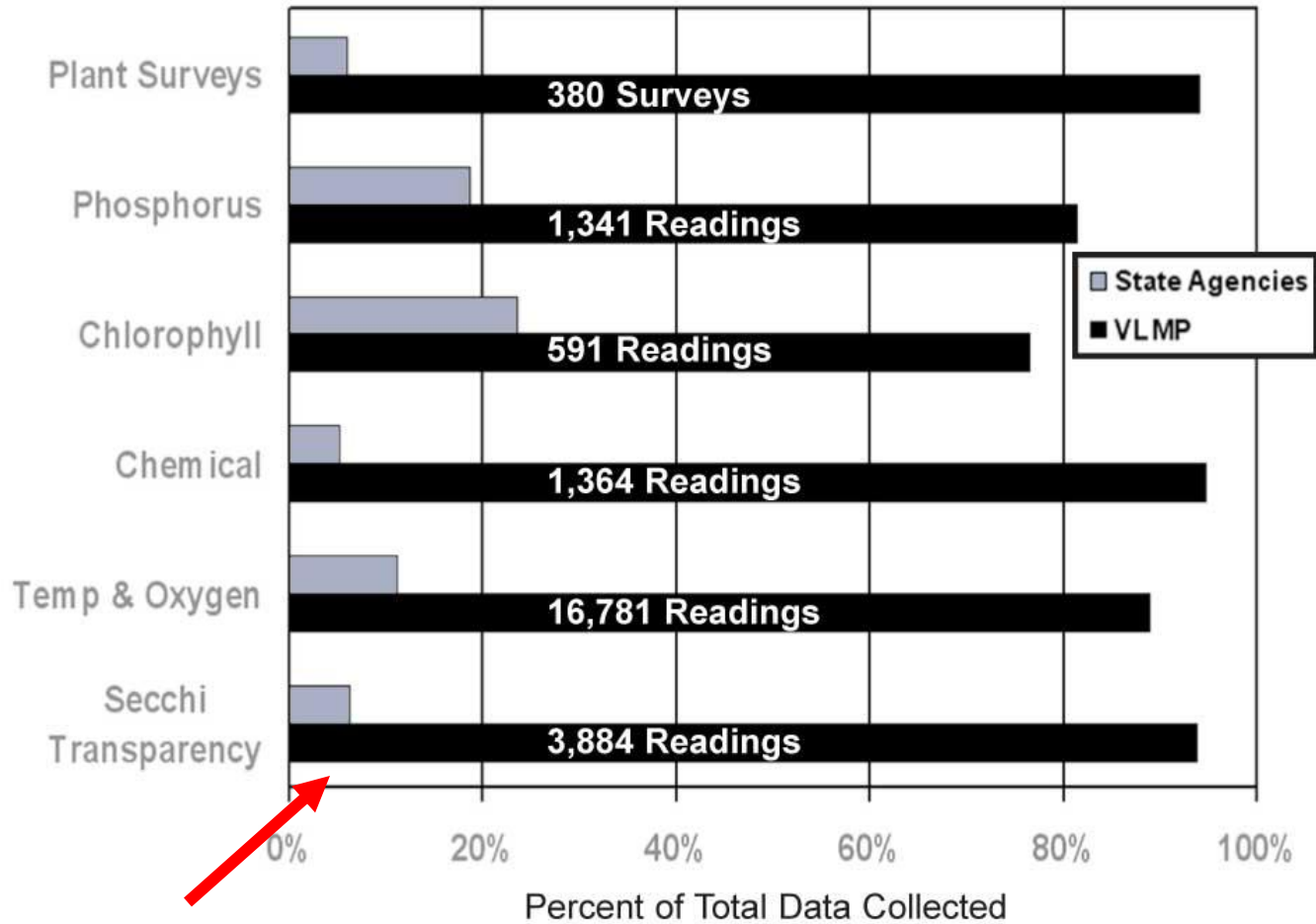VLMP is the Largest Collector and Provider of Lake Data in the State of Maine

2009

608 volunteers collected *water quality* data from 440 Maine lakes

Map by: Peter Vaux
University of Maine

Maine lakes with certified volunteer Water Quality Monitors in 2009

Percentage of Lake Data Readings Collected by VLMP and State Agencies in 2009
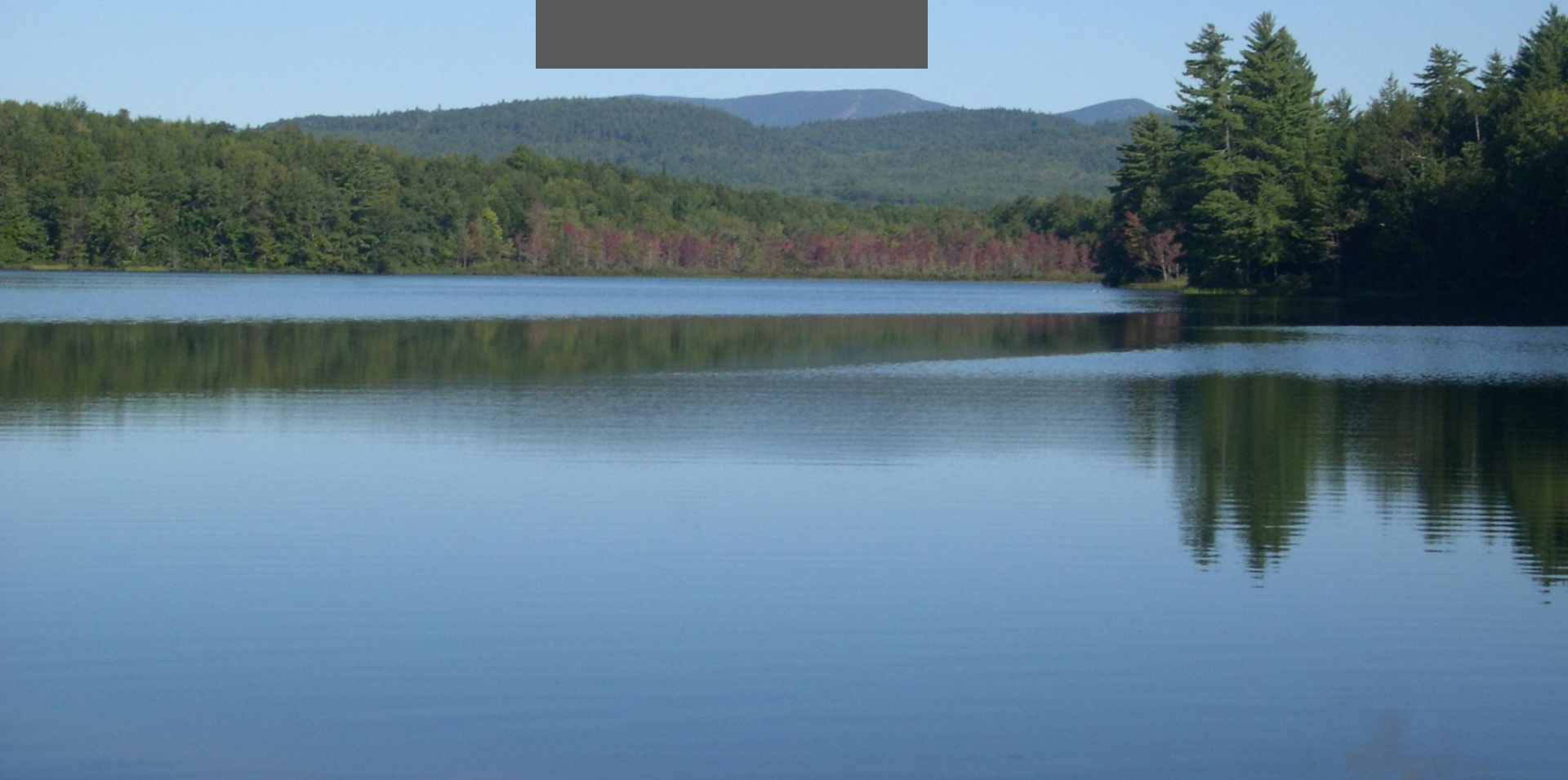
Two Questions:

1. What attribute/characteristic of Maine's lakes and ponds do you value most?

2. What do you consider to be the greatest threat to the health of Maine's lakes?

User Perception Survey Response

CLEAR WATER
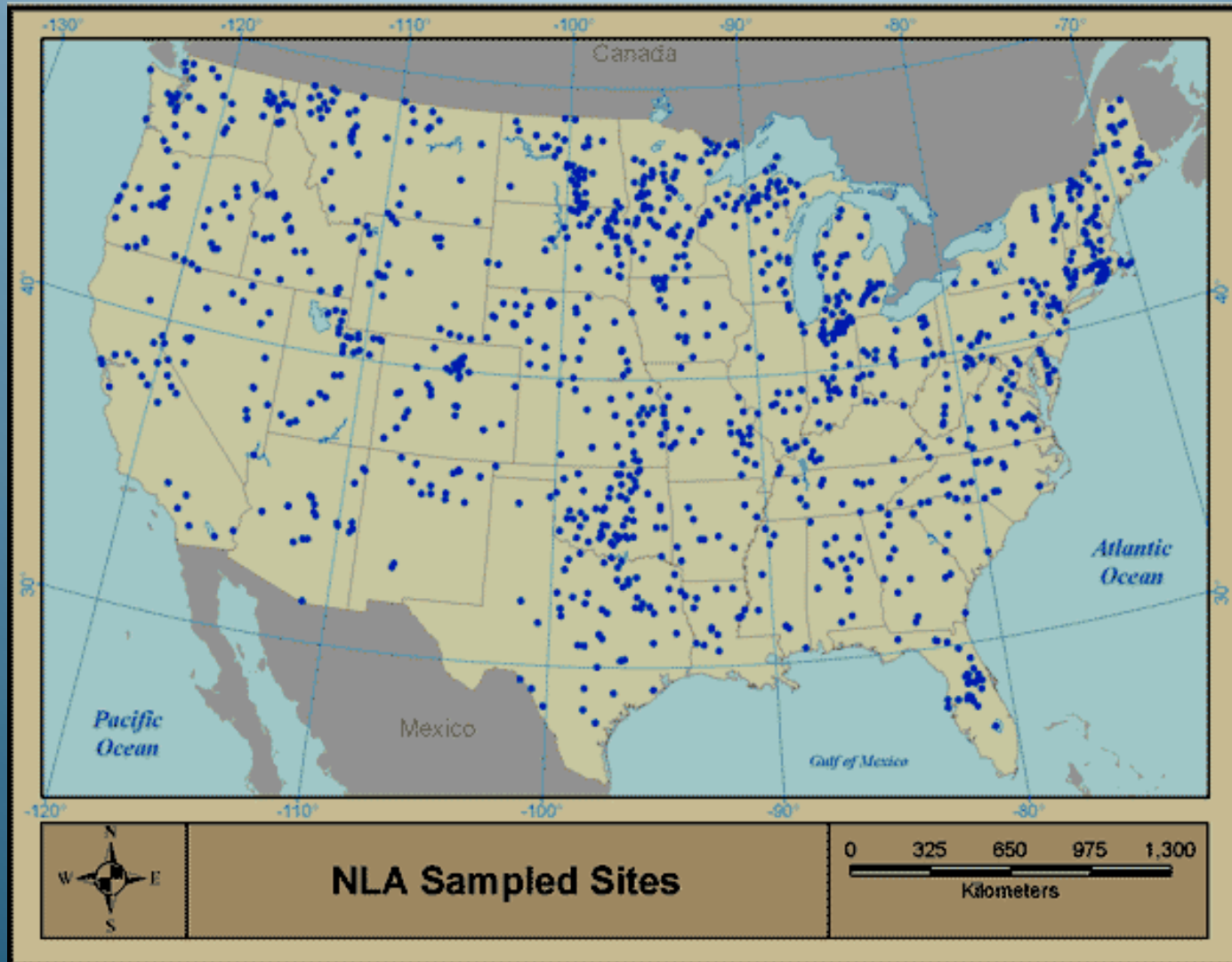
Two Major Threats to Clear Water

Algae

Invasive Plants

National Lakes Assessment

NLA Sampled Sites

1,028 Lakes Studied in 2007
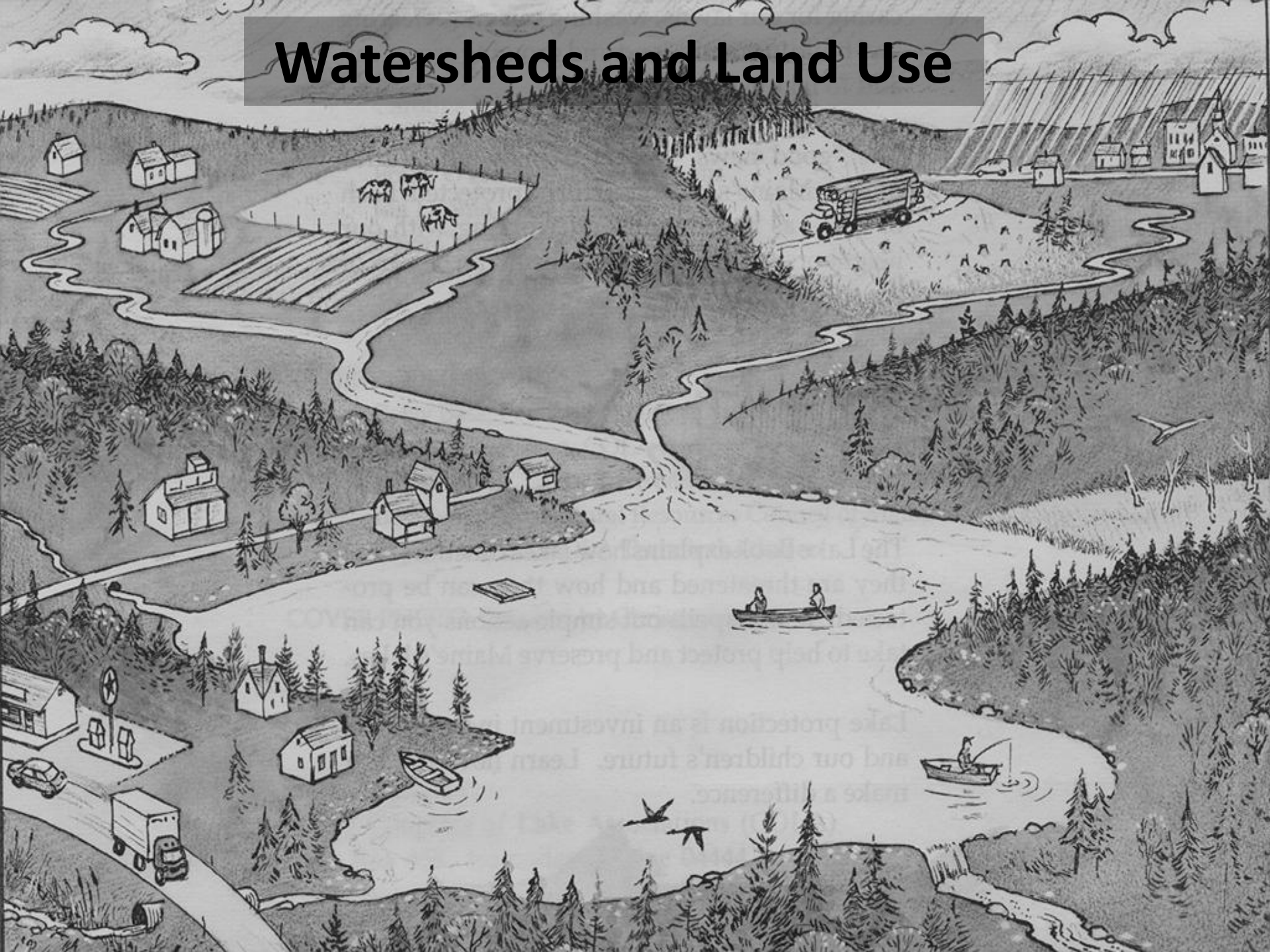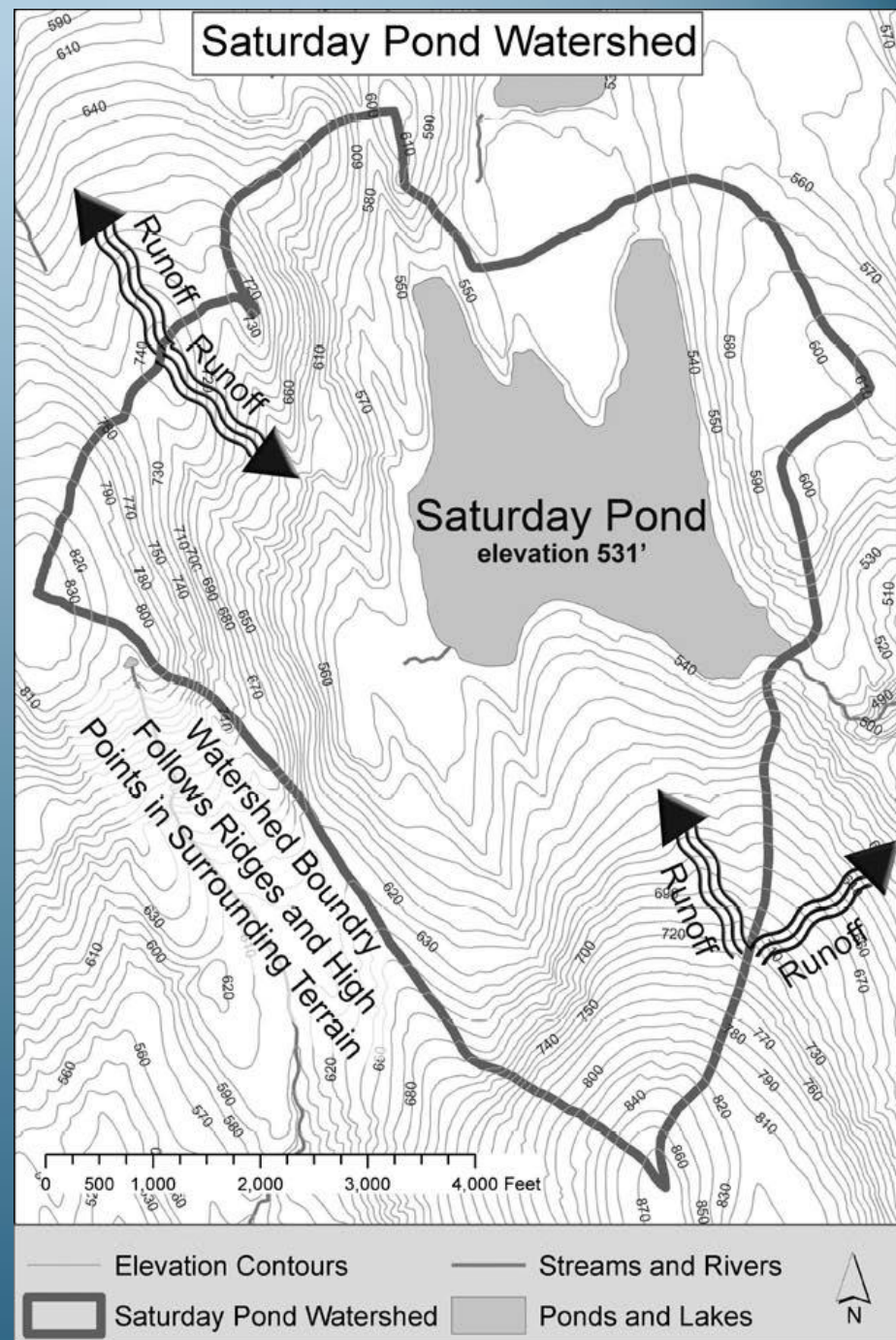
Obvious Degraded Shoreline Habitat

Polluted Stormwater Runoff
From Watershed Development

Watersheds and Land Use

- A lake watershed is part of the lake ecosystem!

- The natural characteristics of a lake are directly influenced by the watershed

- 90% of protecting/managing a lake involves protecting/managing the watershed

It All Adds Up!

How Impervious Surfaces Change the Water Budget

Natural Cover

Developed Land   75-100%
Impervious Surface

Evaporation
40%

Runoff

10%

Infiltration
50%

55%

30%

15%
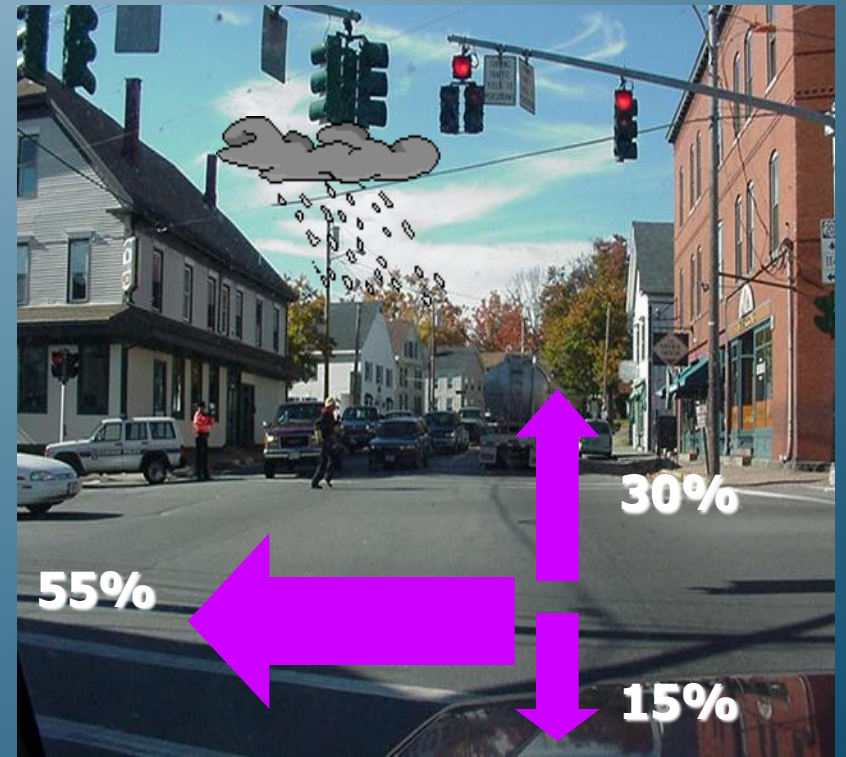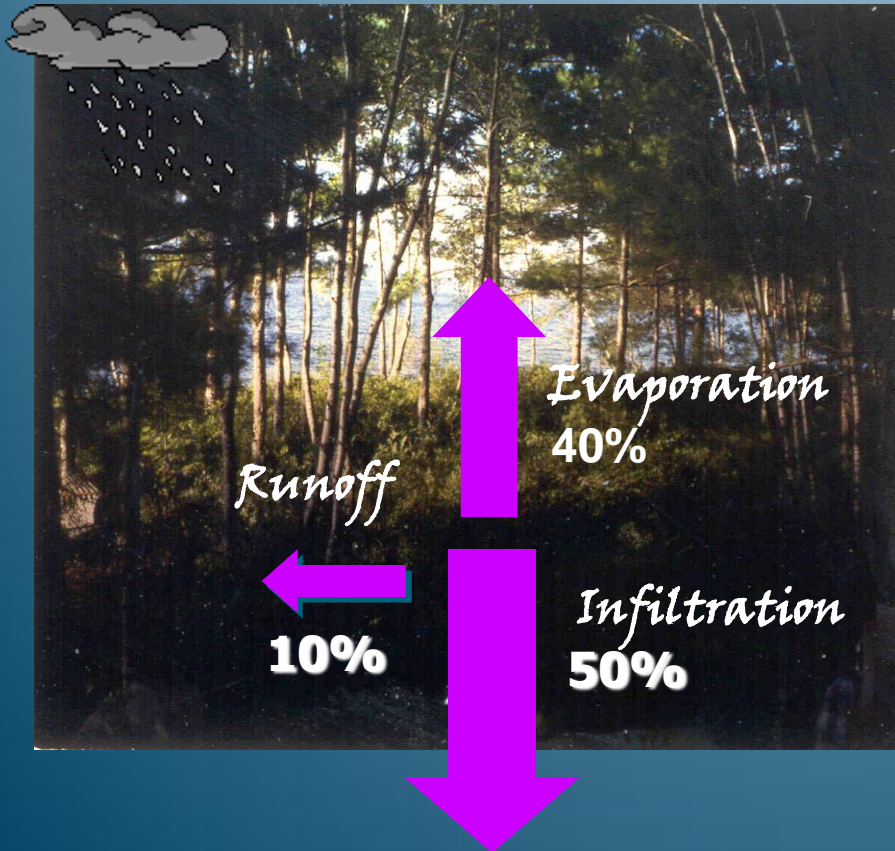
Every Time it Rains:
Polluted Stormwater Runoff !

Trivia: What is the largest pollutant in the world?

Lakes are Highly Sensitive to the Nutrient Phosphorus

- Soil erosion
- Fertilizers
- Animal waste
- Septic systems
- Decaying organic matter
- Stormwater runoff is the transport vehicle

Increasing Algal Growth is Typically Cumulative, and May Take Years to Document

Effect of Watershed Development on Lake Water Quality

- Increase in phosphorus in stormwater =>

- Increase in phosphorus levels in the lake =>

- Increase in the growth of algae =>

- Declining water clarity (Transparency) =>

- Dissolved oxygen loss over time =>

- Negative impact to fishery, changes in biodiversity and overall ecological degradation
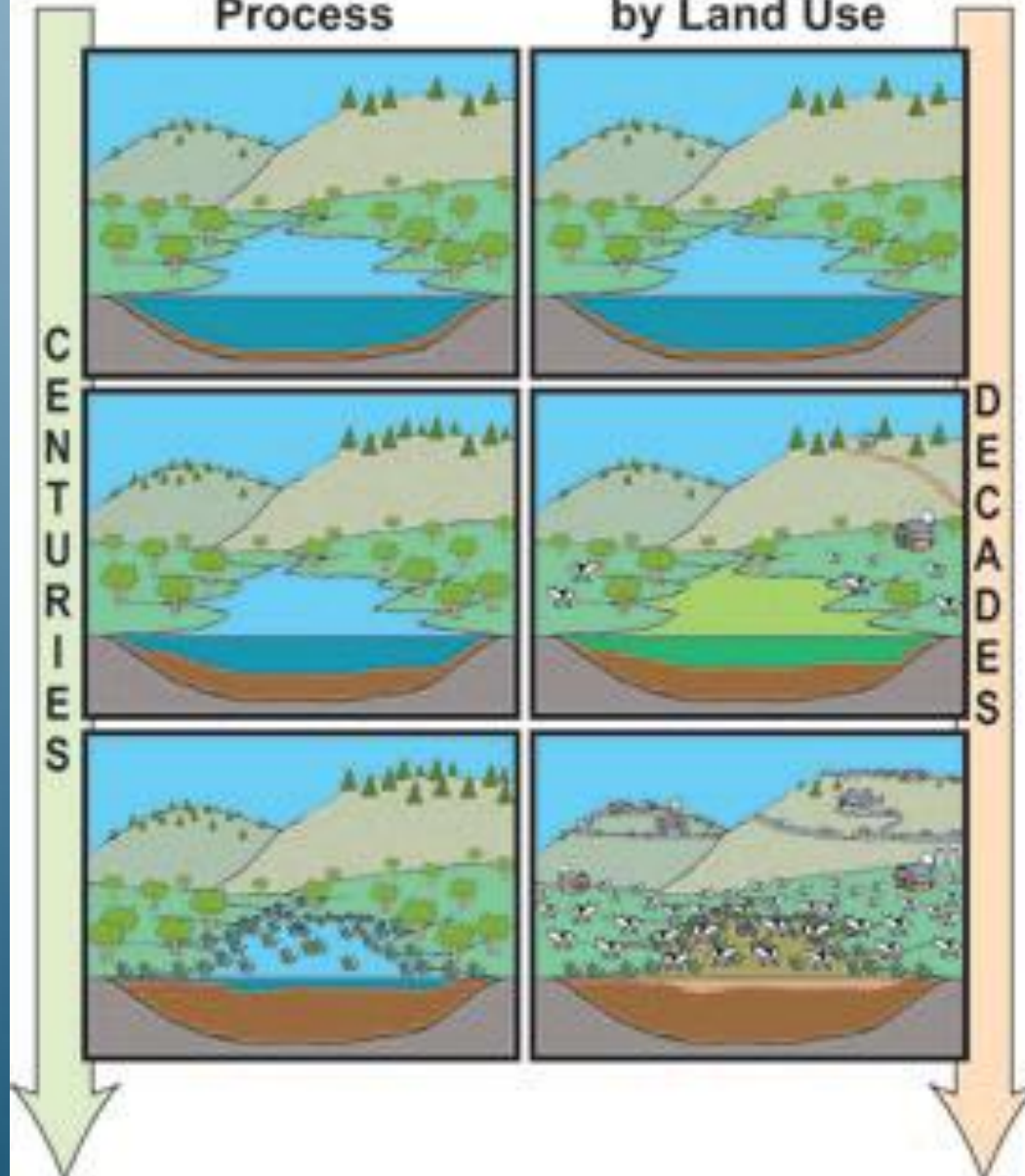
Range Ponds

	Lower	Middle	Upper
Max Depth (ft)	41	66	38
Average Depth (ft	15	29	20
Surface area in acres	292	386	336
Flushing Rate/year	3.83	0.95	0.70
Direct Watershed area (sq. mi.)	3.46	4.95	4.08

"Turnover" and Thermal Stratification
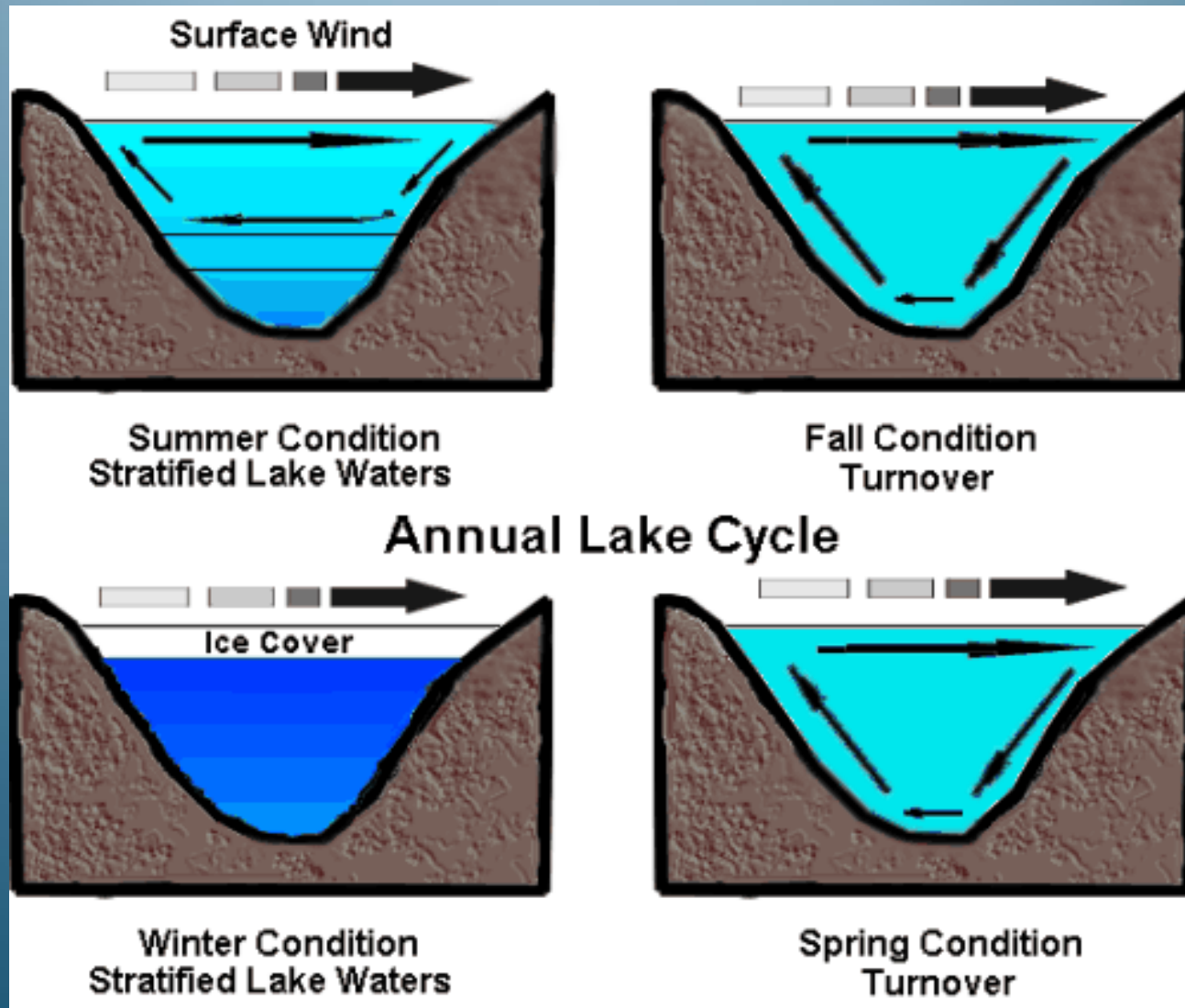
Water Quality Overview (Historical Averages)

	Lower	Middle	Upper
Clarity (M)	6.9	6.1	6.4
Phosphorus (ppb)	8	8	8
Chlorophyll (ppb)	3.6	4.2	4.4
Color (SPU)	10	13	13
Dissolved Oxygen Loss	Moderate depletion	Low-Moderate Depletion	Moderate depletion
Algae Bloom potential	Moderate	Low	Moderate
Overall	Above average	Above average	Above average

Weather Influences

- *Temperature*

- *Wind*

- *Precipitation*

- *Sunlight*

Transparency (clarity) of Maine's Lakes, Compared to Their Historical Averages
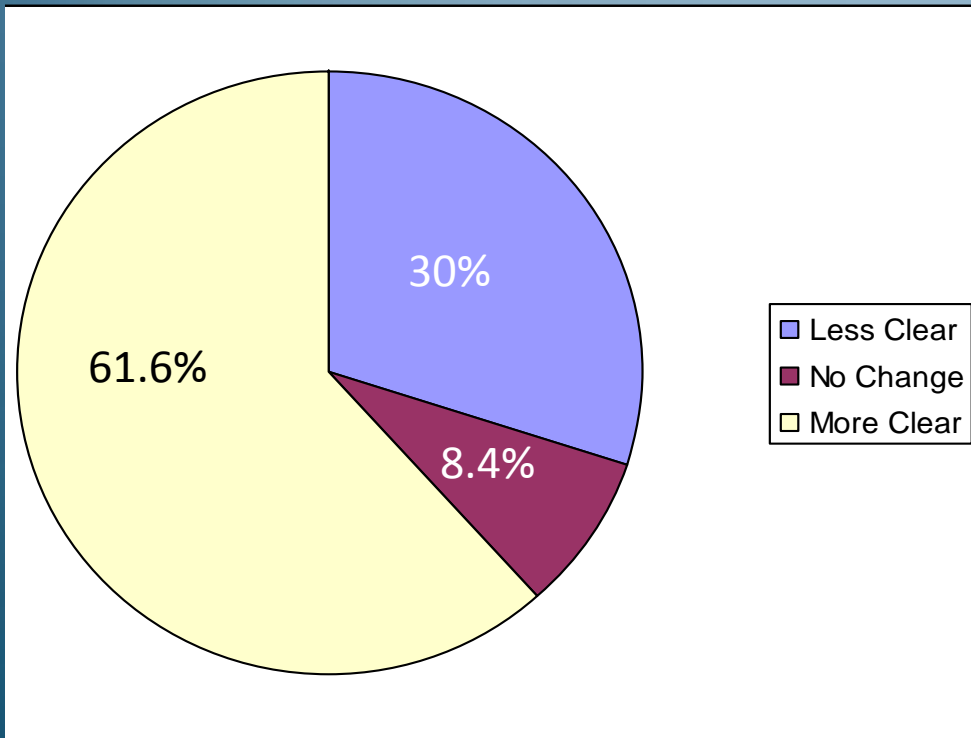
2007   404 Lakes
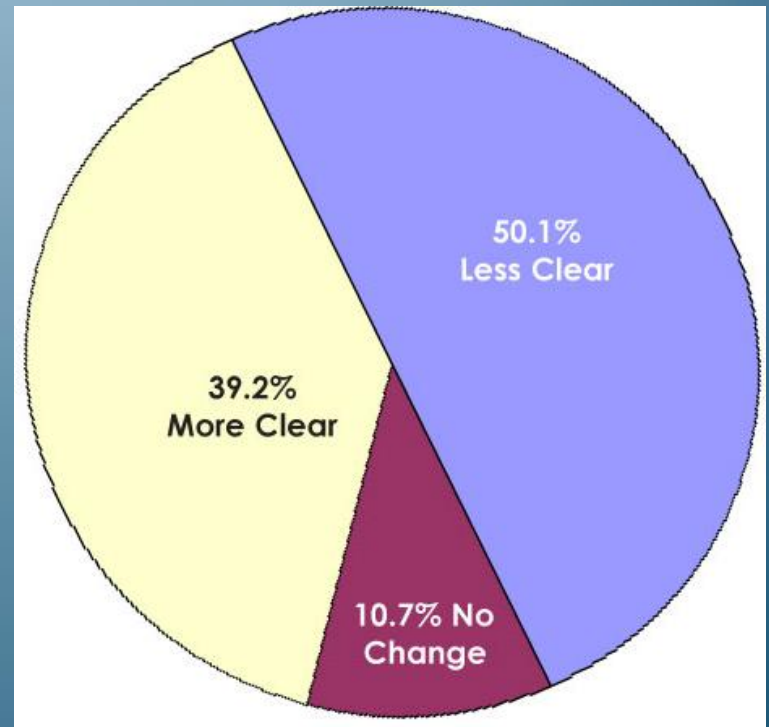
2009 457 Lakes

Transparency of Maine Lakes
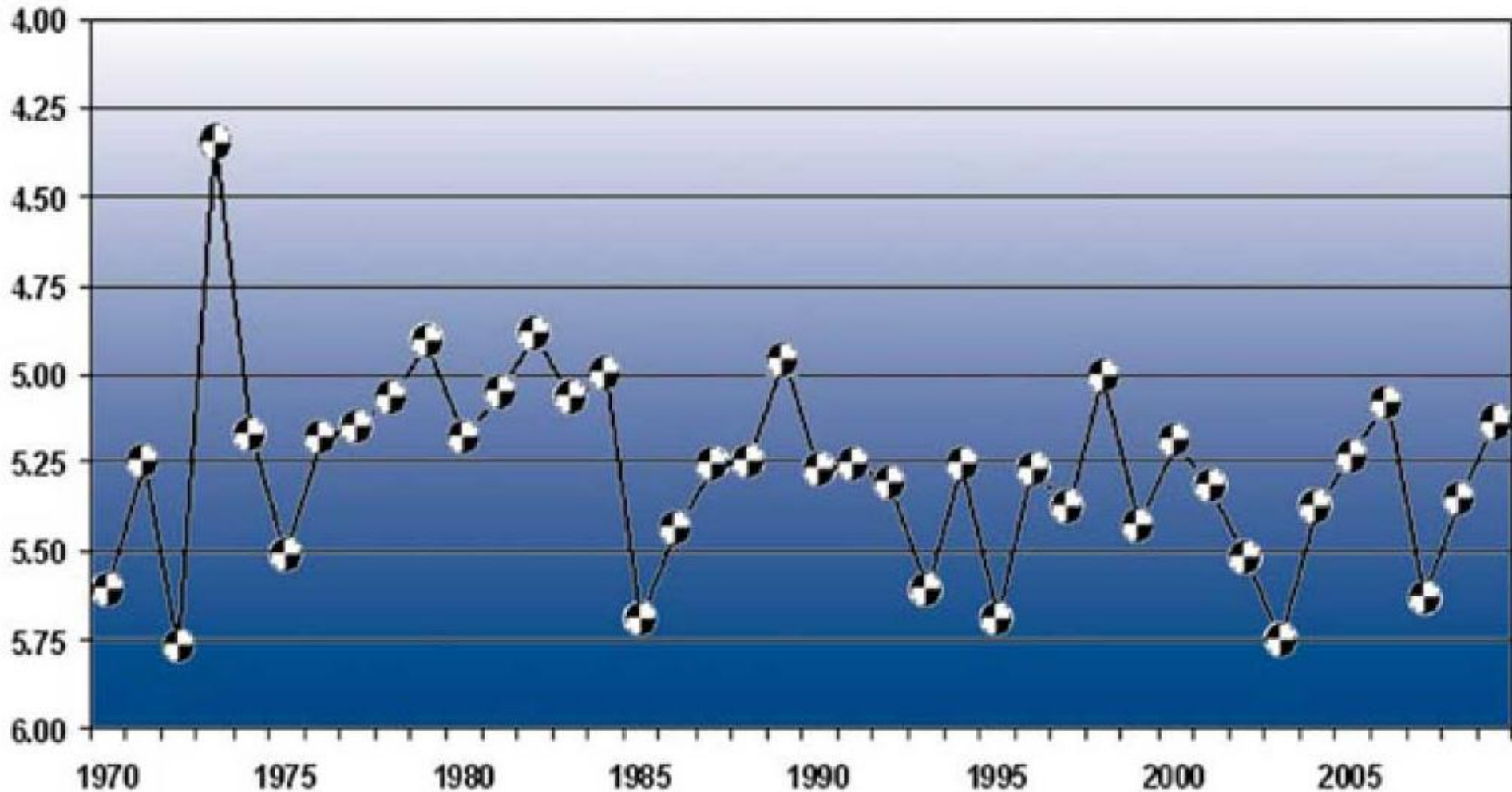
Thank You Volunteer Water Quality Monitors!

- Upper Range: Matthew Brettler; Anne Gagne

- Middle Range: Barry Kutzen; C.L Townsend Jr.

- Lower Range: John Crouch; Poppy Connor-Crouch

Vegetated Buffers Protect Lakes from Runoff and Phosphorus

Invasive Aquatic Plants (and Animals!)

VLMP Center for Invasive Aquatic Plants

Seven Years Old !

Training

- Fifteen Invasive Plant Patrol (IPP) workshops in 2009
  - 11 introductory workshops,
  - 1 survey methods workshop
  - 2 abbreviated training sessions
  - 1 manual control workshop
- Spanned the state, from Acton to Frenchville

Trained Eyes

Variable Milfoil Control in the Range Ponds

- Early detection
- Consistent, effective, mapping and removal of milfoil for several years
- Many hundreds of hours of volunteer effort
- 2010 survey: No Milfoil has been found
- Kudos to Bob and Gloria Limoges, and supporting volunteers!

VLMP
Invasive Plant
Patroller

Dick
Butterfield
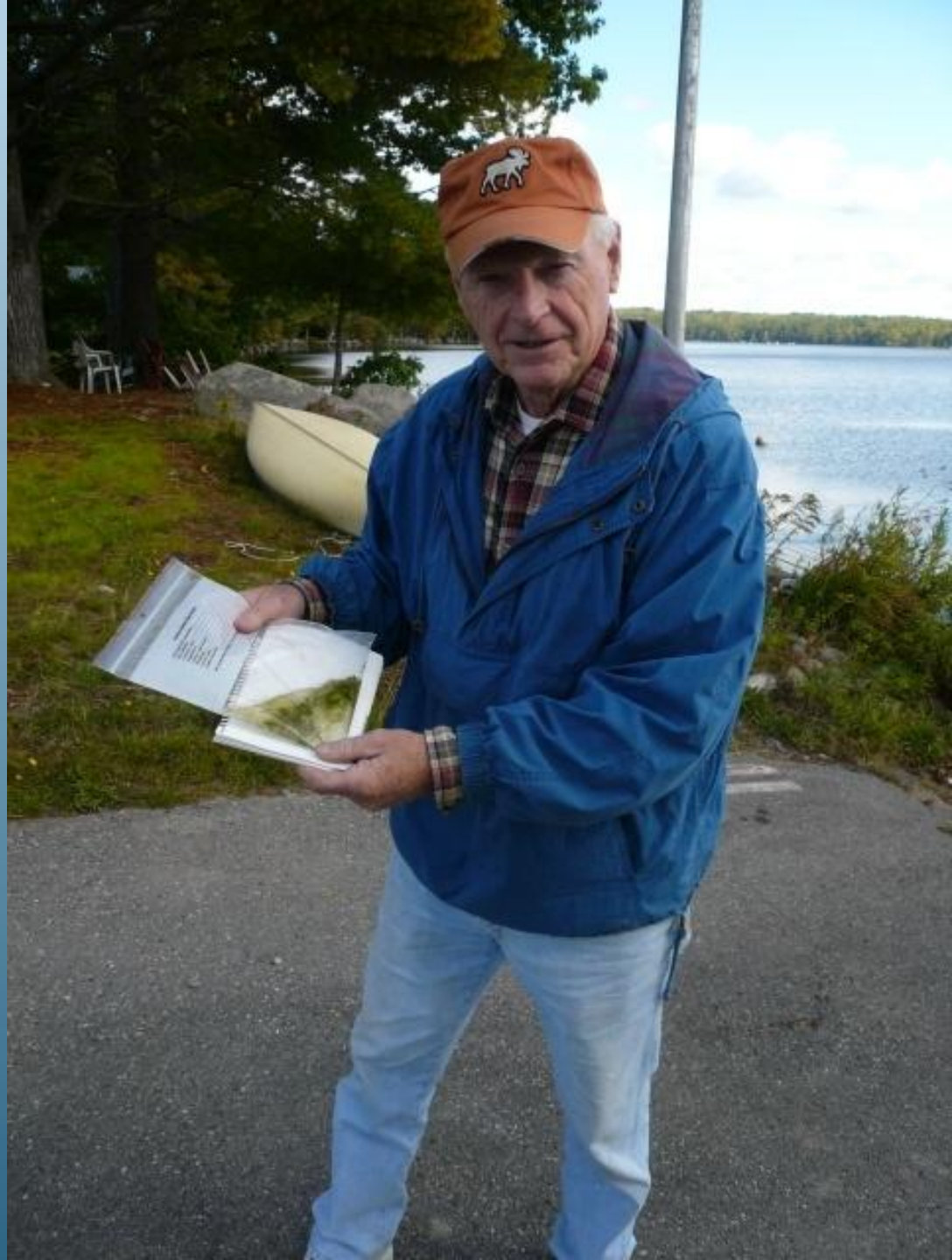
Public involvement in this issue is essential!

We are making a difference!

INVASIVE AQUATIC PLANTS

- Brazilian elodea
- Fanwort
- Hydrilla
- European frogbit
- European naiad
- Parrot feather

- Eurasian water-milfoil
- Variable water-milfoil
- Water chestnut
- Yellow floating heart
- Curly leaf pondweed

Northern Pike

Rusty Crayfish

Zebra & Quagga Mussels

Invasive Fauna

Chinese Mystery Snail

Chinese Mitten Crab

Asiatic Clam

Spiny Water Flea

Invasive Algae

Starry Stonewort

Didymo *(Rock Snot)*

Native Plants Benefit Maine's Lakes and Ponds

Native plants protect water quality, provide diversity and beauty, occupy areas of the lake otherwise available to invaders

Vermont's Experience

Lake Champlain

Milfoil Spread in Vermont

1962

Lake Parker Association, Inc.
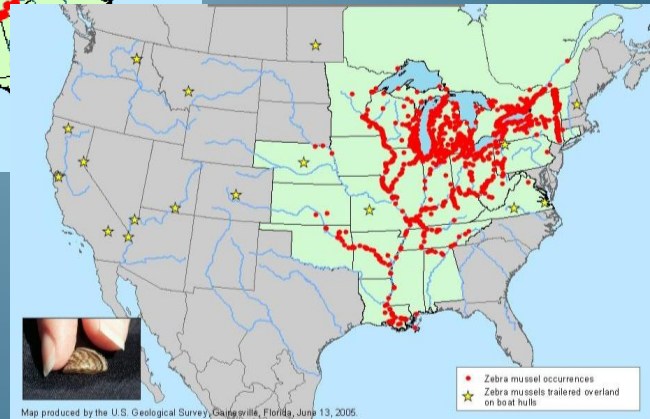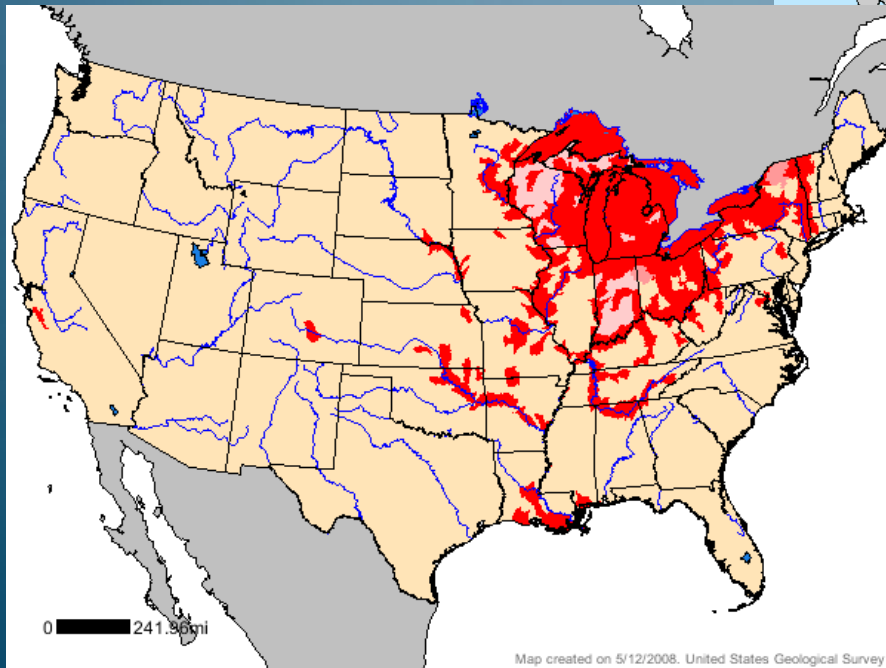
Zebra Mussel Infestations

1988

1993

2005

2008

Source: USGS

Primary Vector

32 Known Infestations in Maine
(as of June 2010)

Waterbodies Containing Invasive Aquatic Plants
www.maine.gov/dep/blwq/topic/invasives/index.htm

- - - - - County Boundaries
———— Town Boundaries

0   5   10   20   30 Miles

ID	Name	Species	ID	Name	Species
1	Balch & Stump Ponds	variable leaf milfoil	17	Pickerel Pond	hydrilla
2	Brandy Pond	variable leaf milfoil	18	Pleasant Hill Pond	eurasian water milfoil
3	Bryant Pond	variable leaf milfoil	19	Pleasant Lake Outlet	variable leaf milfoil
4	Cobbossee Stream	variable leaf milfoil	20	Pleasant Pond	variable leaf milfoil
5	Collins Pond	hybrid variable leaf milfoil	21	Presumpscot River	variable leaf milfoil
6	Cushman Pond	variable leaf milfoil	22	Salmon Lake	eurasian water milfoil
7	Hogan Pond	variable leaf milfoil	23	Sebago Lake	variable leaf milfoil
8	Lake Arrowhead	variable leaf milfoil	24	Shagg Pond	variable leaf milfoil
9	Lake Auburn	variable leaf milfoil	25	Skelton Flowage in Saco River	variable leaf milfoil
10	Little Androscoggin River	variable leaf milfoil	26	Songo River	variable leaf milfoil
11	Little Ossipee River	variable leaf milfoil	27	Spaulding Pond	variable leaf milfoil
12	Little Sebago Lake	hybrid variable leaf milfoil	28	The Basin	variable leaf milfoil
13	Messalonskee Lake	variable leaf milfoil	29	Thompson Lake	variable leaf milfoil
14	Messalonskee Stream	variable leaf milfoil	30	West Pond	curly leaf pondweed
15	Middle Range Pond	variable leaf milfoil	31	Damariscotta Lake	hydrilla
16	Parker Pond Outlet	variable leaf milfoil	32	Legion Pond	european naiad

Variable Water-milfoil

Range Pond photo

26 Maine Waterbodies
Androscoggin, Cumberland, Kennebec, Oxford & York Counties

(2 infested with a variable milfoil hybrid)

Eurasian Water-milfoil

Salmon Lake, Belgrade
KENNEBEC COUNTY

Pleasant Hill Pond, Scarborough
CUMBERLAND CO

Hydrilla: Pickerel Pond in Limerick and Damariscotta Lake

Curly Leaf Pondweed

West Pond, Parsonsfield, YORK CO

European Naiad

Legion Pond, Kittery, YORK CO

Thank you for joining us in the effort to protect Maine lakes from the threat of aquatic invaders!

Please Consider Supporting the VLMP