Cold Stream Pond Association
President, Tom Quirk

All Maine Lakes are Vulnerable with few exceptions

- July 27, 2019

A Provocative and Bold Statement

Let's explore supporting information that leads me to make the statement.

Since 1959 I have been involved with and visited many of Maine's lakes and ponds, most in the public domain.

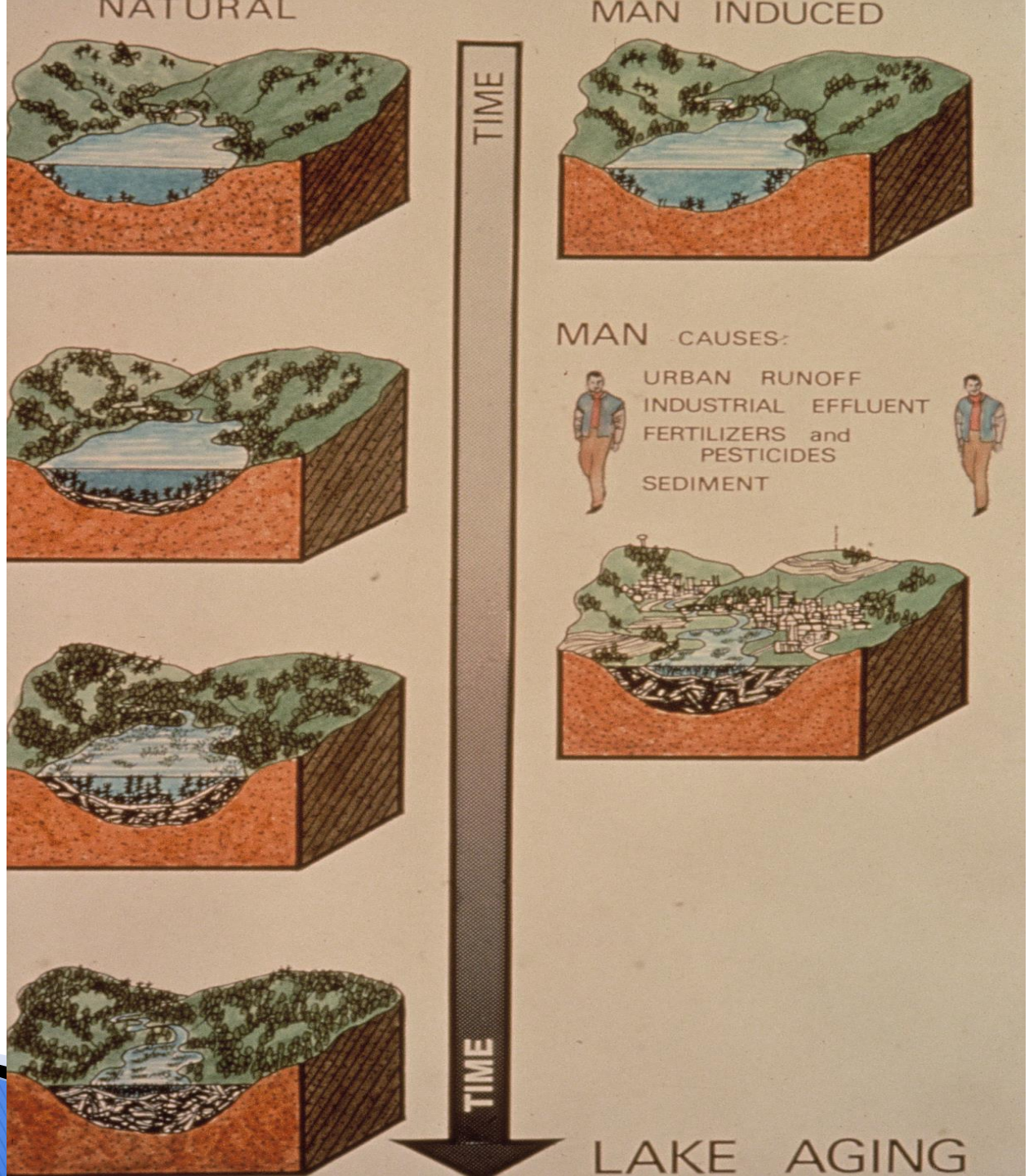
The common denominator, of all concern, is people.

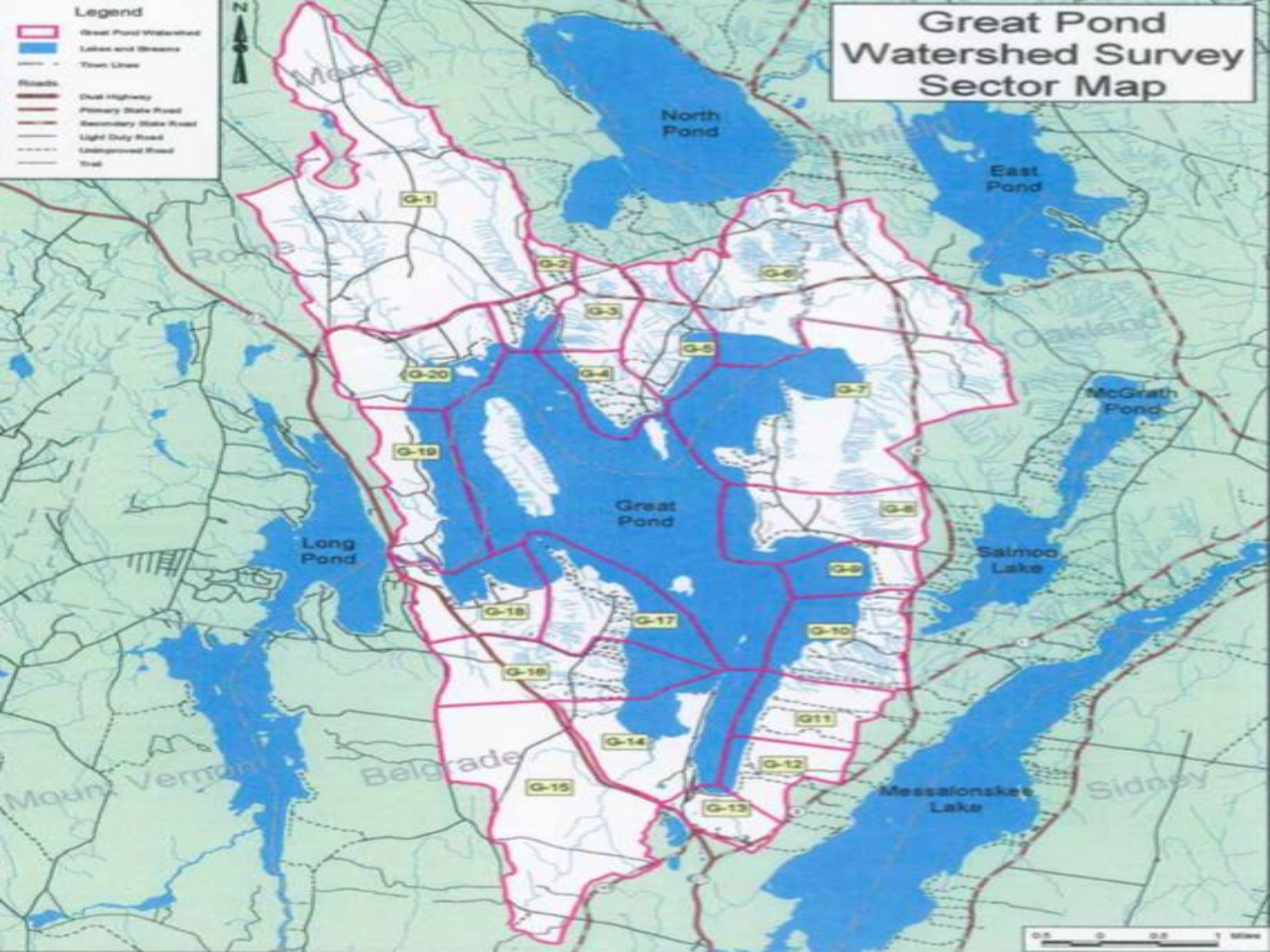
People are the problem of pollution.

Thus we are also the solution

Maine Lake Vulnerability

- All lakes are vulnerable over time- Exceptions
- All lakes in Maine are different: small, large some are eutrophic and some oligotrophic, many are mesotrophic and some dystrophic.
- The vulnerability depends on how all of us treat and care for the water quality.
- Time will tell us what the future holds
- More on MLV later


NATURAL
MAN INDUCED
TIME
MAN CAUSES:
URBAN RUNOFF
INDUSTRIAL EFFLUENT
FERTILIZERS and PESTICIDES
SEDIMENT
TIME
LAKE AGING


Great Pond Watershed Survey Sector Map
Legend
Great Pond Watershed
Lakes and Streams
Town Lines
Roads
Dual Highway
Primary State Road
Secondary State Road
Light Duty Road
Unimproved Road
Trail
N
North Pond
East Pond
McGrath Pond
Great Pond
Long Pond
Salmon Lake
Messalonskee Lake
Mount Vernon
Belgrade
Sidney
G-1
G-2
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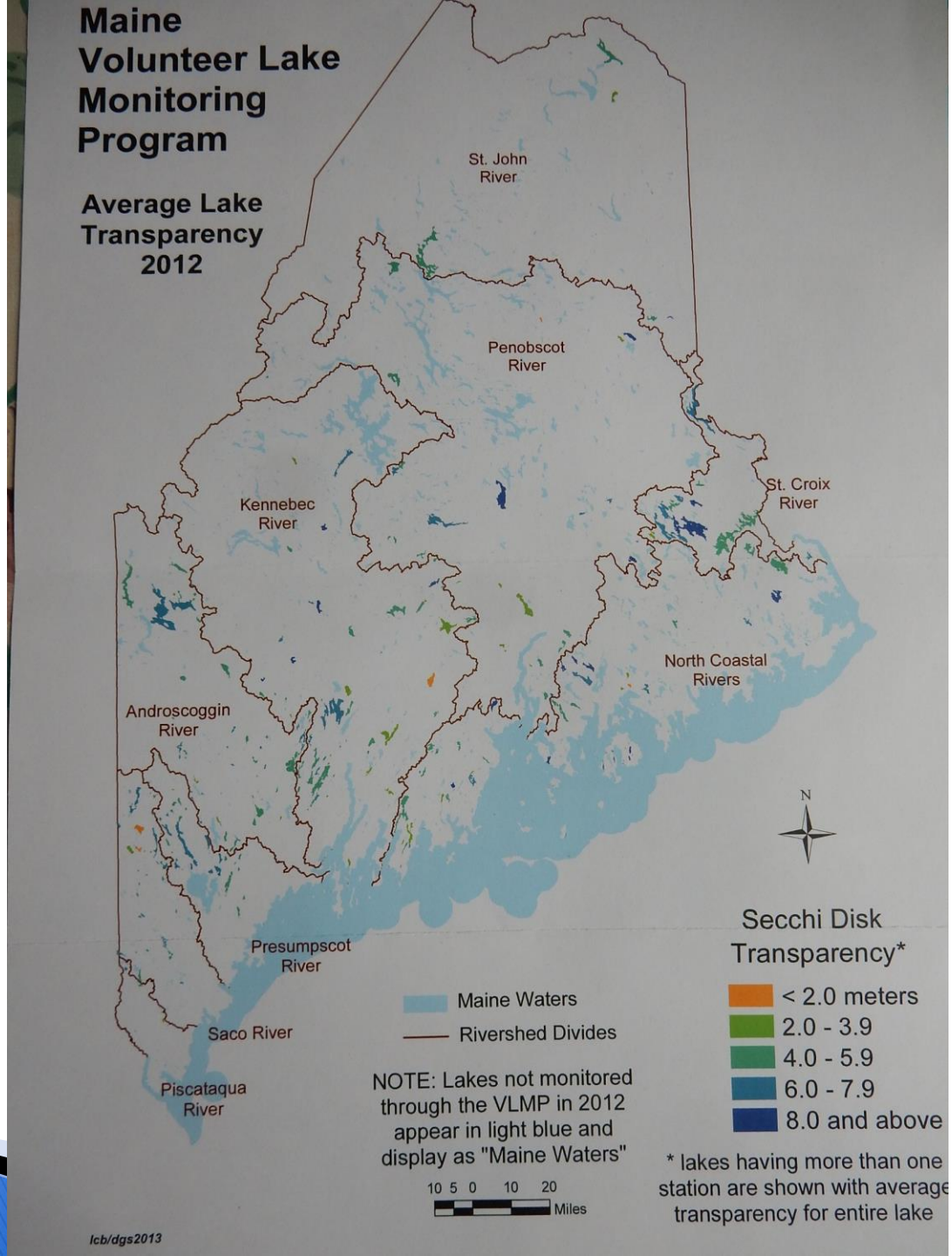

Maine Volunteer Lake Monitoring Program
Average Lake Transparency 2012
St. John River
Penobscot River
St. Croix River
Kennebec River
North Coastal Rivers
Androscoggin River
Presumpscot River
Saco River
Piscataqua River
N
Maine Waters
Rivershed Divides
NOTE: Lakes not monitored through the VLMP in 2012 appear in light blue and display as "Maine Waters"
10 5 0 10 20
Miles
Secchi Disk Transparency*
< 2.0 meters
2.0 - 3.9
4.0 - 5.9
6.0 - 7.9
8.0 and above
* lakes having more than one station are shown with average transparency for entire lake
lcb/dgs2013

Cold Stream Pond

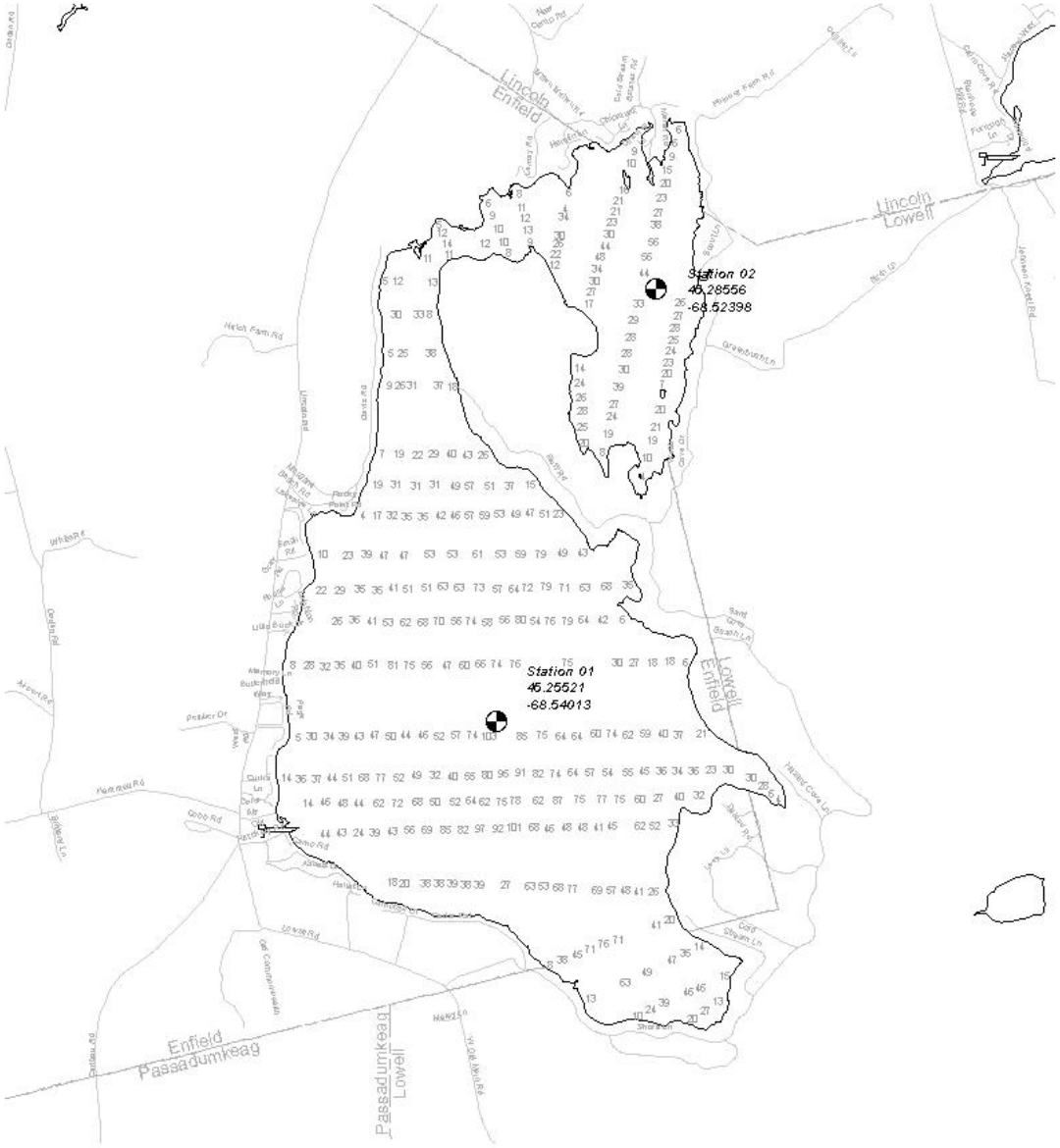
MIDAS # 2146

Lowell, Penobscot Co. - Delorme Page 33 - 3620 acres

Boat Launch Lake Sample Stations # Depth (FT)

0 0.8 1.6 2.4 3.2 4 Miles

N W E S



Cold Stream Pond

MIDAS # 2146

Lowell, Penobscot Co. - Delorme Page 33 - 3620 acres

Boat Launch | Lake Sample Stations | # Depth (FT) | Roads | Town Lines

0 0.8 1.6 2.4 3.2 4 Miles

N W E S

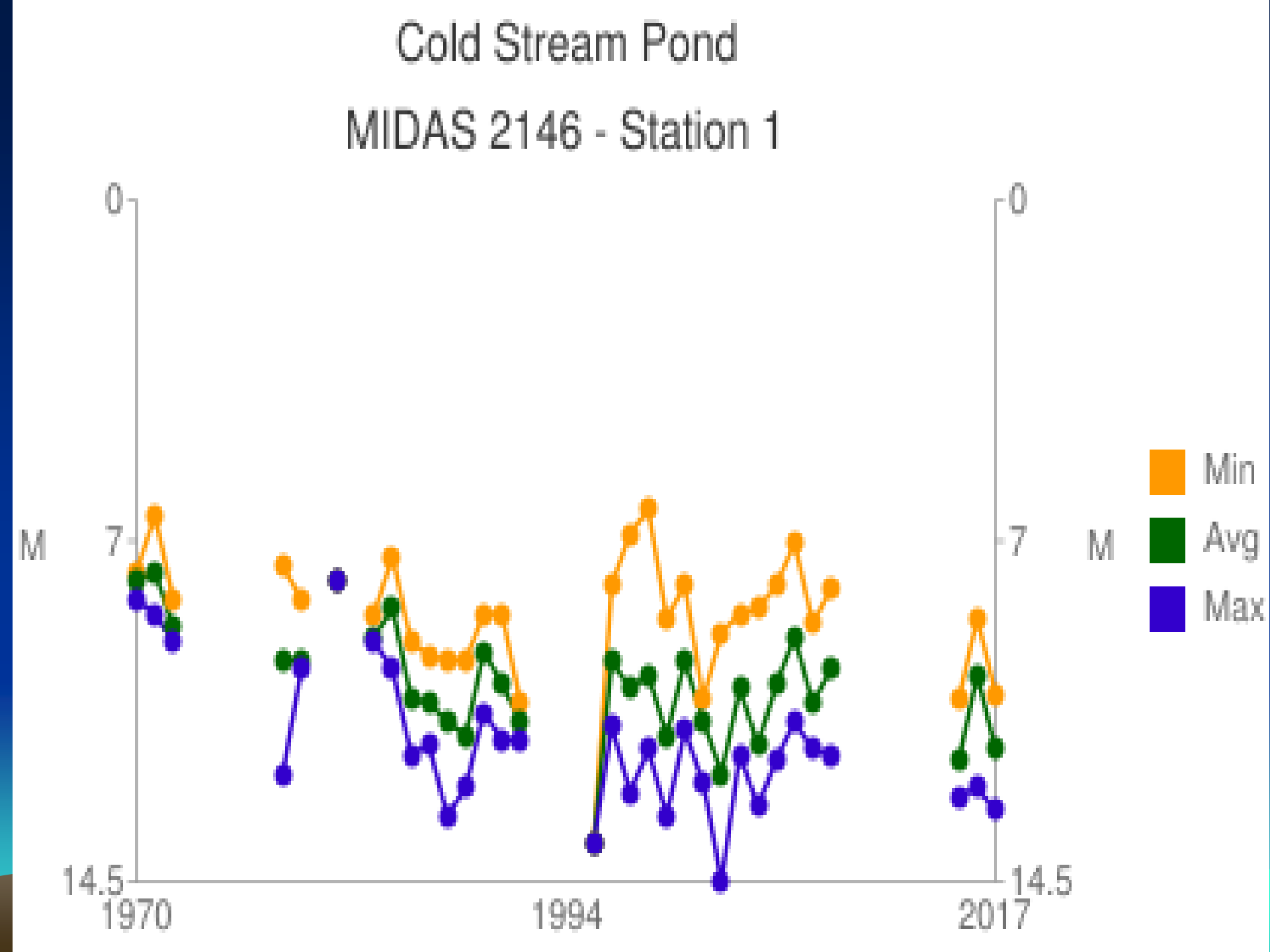
Physical Data for Cold Stream Pond

- Lake area – 2,928 acres
- Drainage Area – 4,672 acres
- Flushing Rate – 0.23 per year or HRT 4.3 yrs.
- Ratio of DA/LA 1.6

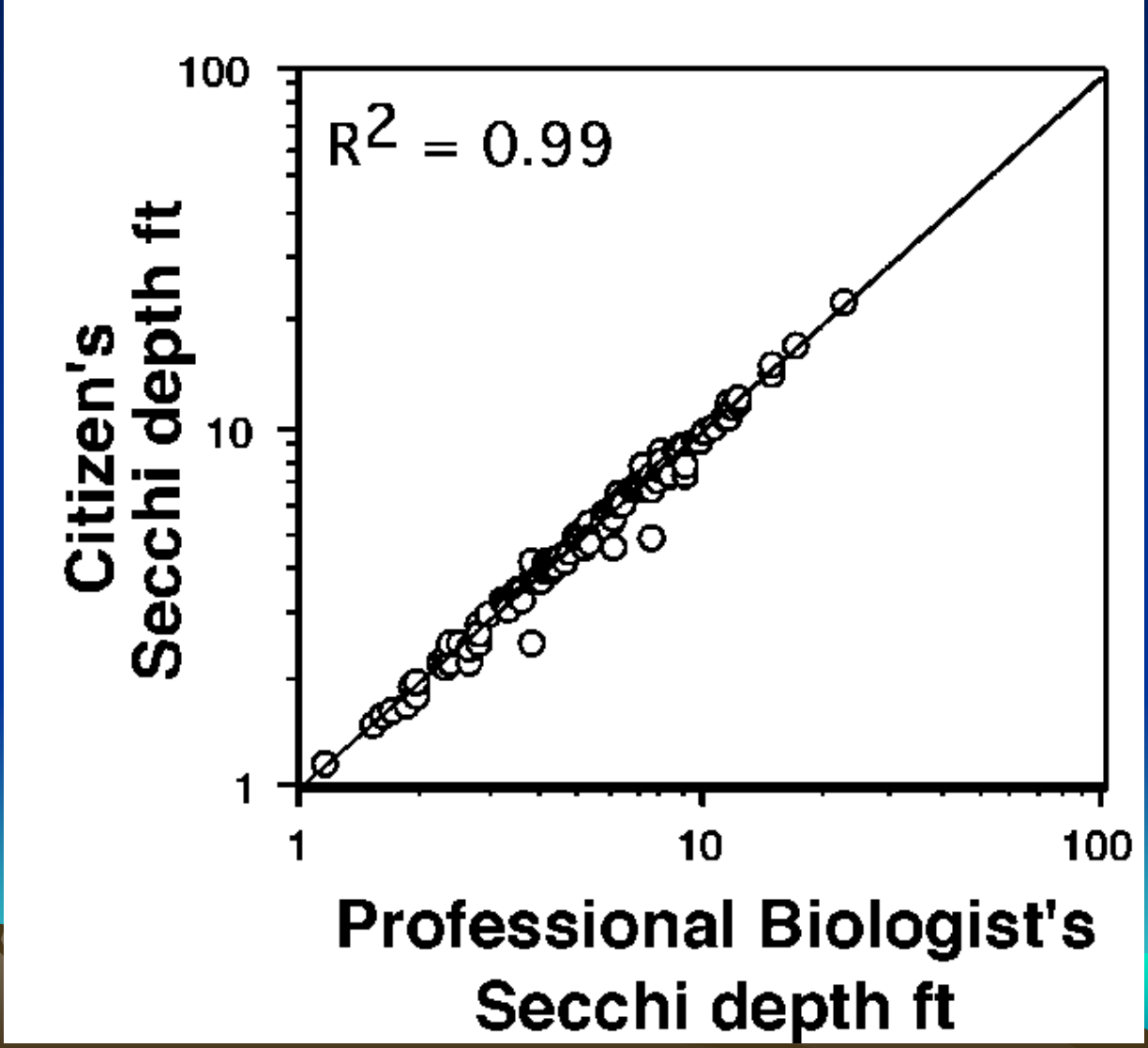
Water Quality Data

- TP 8 ppb
- Chl a 1.5
- TA 6.3 ppm
- Color 10 spu
- Cond. 30 umhos/cm
- Ph 6.3
- SD 9.9 meters(30 ft)
- TSI – less than 25

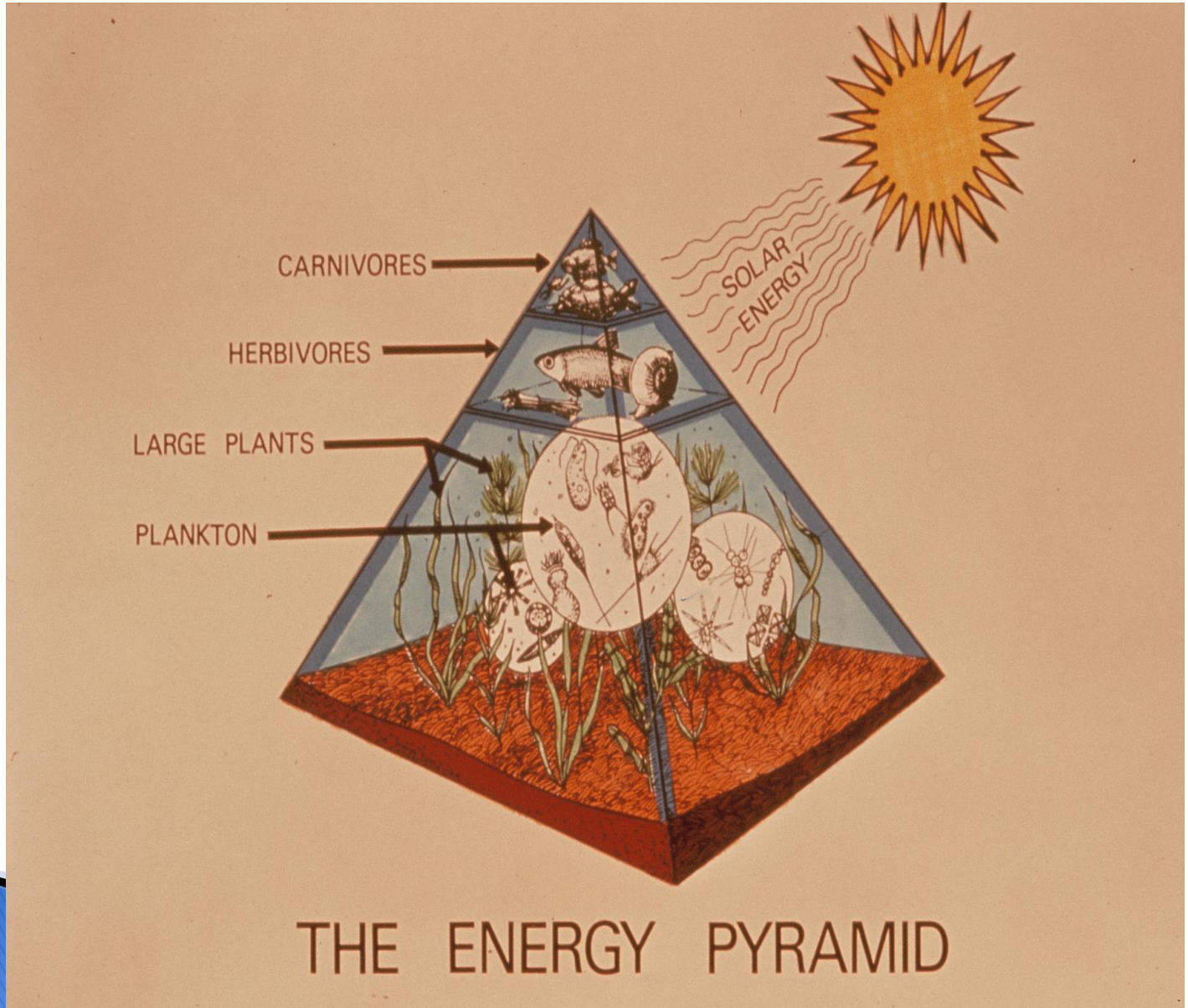

MAINE VOLUNTEER
LAKE MONITORING PROGRAM


Cold Stream Pond
MIDAS 2146 - Station 1
0
7
14.5
M
1970
1994
2017
Min
Avg
Max

Comparison of Volunteer and Professional Data



SUPERORGANISMS



CHANGE

Scott Williams
Executive Director

Lake Stewards of Maine

- The VLMP the oldest citizen lake monitoring organization in North America, created by Maine State statute, 1971

Fisheries Management

- Primarily- Coldwater LL Salmon and Lake Trout (Togue)
- Thermally – Strongly stratified
- Double Basin Lake
- Total area – 2928 acres
- Drainage Area – 4672 acres
- Max Depth 104’
- Mean Depth 14’
- Penobscot River drainage.
- Not known for historical Alewife runs?

CSP Fish Stocking

- Lots of stocking of Brook trout and L.L. Salmon
- Thousands in total for 2018 of various sizes and age class

Maine Lakes Society

FOR THE SAKE OF MAINE'S LAKES

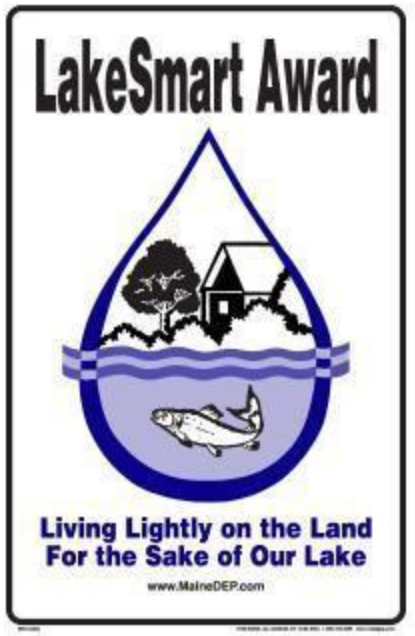
President:
Jennifer Jespersen

Protecting Our Lakes Since 1970

www.mainelakessociety.org

LakeSmart Protects Developed Lakes

- Peer to Peer Learning and Reward Program
- Promotes Lake-friendly Landscaping,
- Brings Understanding and Change,
- And Preserves Habitat



Lake Smart Is Unique

It Changes What People Do

Maine's Eleven Most

UNWANTED

Invasive Aquatic Plants

VLMP

Eurasian Milfoil

Why Join the MLS?

- **To preserve** water quality, our way of life, wildlife and fisheries, and our natural heritage
- **To exercise your right to be heard** as a sportsman, a lake user, a visitor, or a land owner who supports clean lakes
- **To protect** local businesses, lakeshore property values and town tax revenues
- **To be informed** about lake issues through our many platforms, from E-news to the annual Maine Lakes Conference

Maine Lakes Society
FOR THE SAKE OF MAINE'S LAKES

Our Lakes Are Our Legacy

Part of Our Natural Heritage

They Are Habitat

Sport

Inspiration

And Invasive Fish

But Our Lakes Are Fragile

An Oligotrophic Lake

A Eutrophic Lake

And surprisingly sensitive to human activity

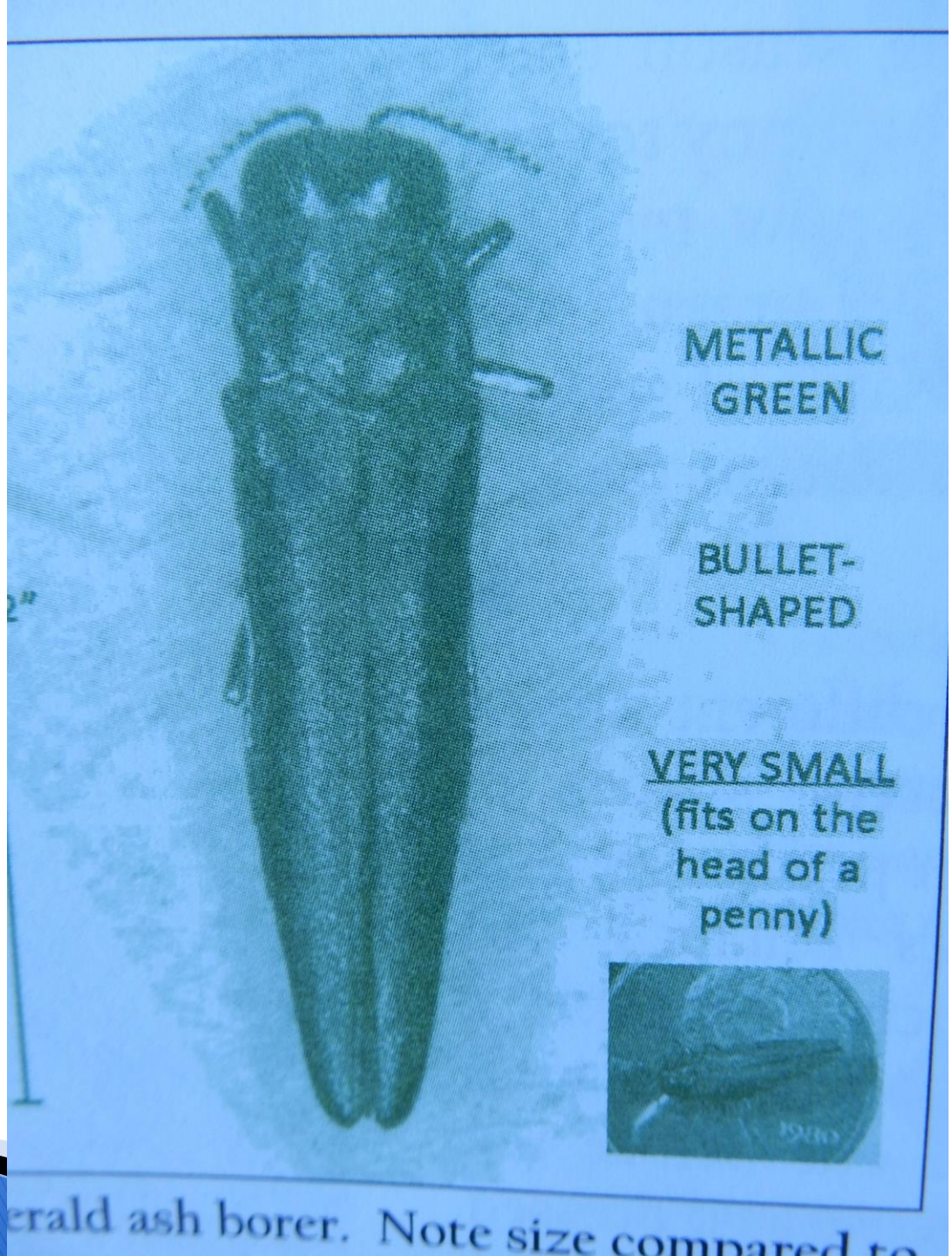
Our Lakes Are Invaluable

- Maine lakes produce ***at least $4.0 billion*** in economic activity every single year*
- Our lakes are used by 650,000 residents every year and supply drinking water to half our population
- Lakes support 56,000 jobs
- Tourism is Maine's #1 industry

*Based on 2017 dollars

Other Invasive's

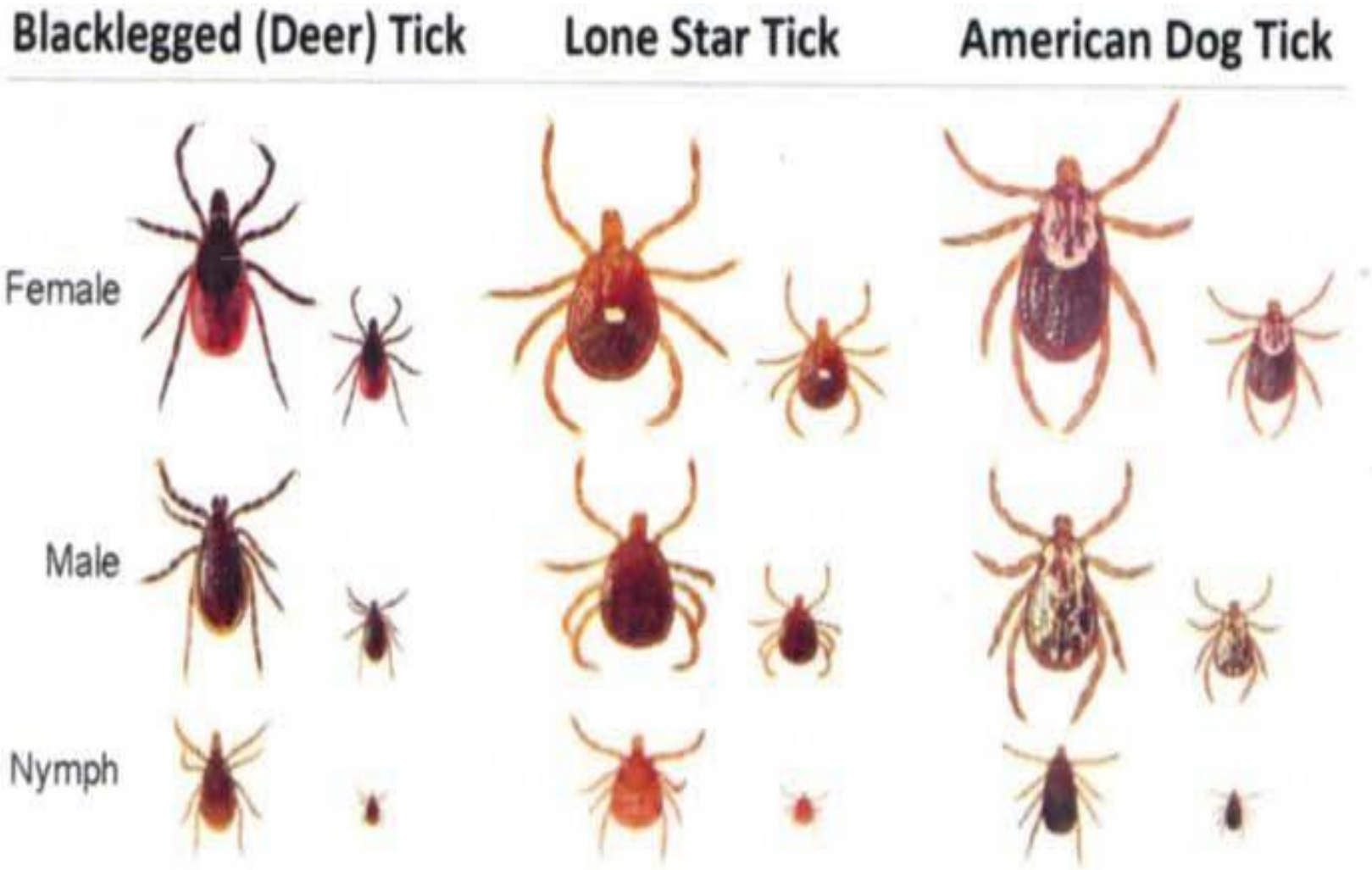
- Some are on our doorsteps
- Others are waiting their opportunity
- Some have been beneficial?



erald ash borer. Note size compared to

Ticks and Insects

- 13 species are in Maine-bacteria vectors
  Deer, dog and Rocky Mt.
- West Nile, EEE mosquito- virus vectors


Blacklegged (Deer) Tick
Lone Star Tick
American Dog Tick
Female
Male
Nymph

Vespa species compared with honey bee

Habitat Fragmentation

- This is where we biologists and citizen scientists see change.
- Development and loss of habitat
- Lakeshore development and year round living
- Habitat being lost due to humankind
- Greater Foot prints and increased Carbon
- Honey bees and other pollinators will suffer or adapt if they can?

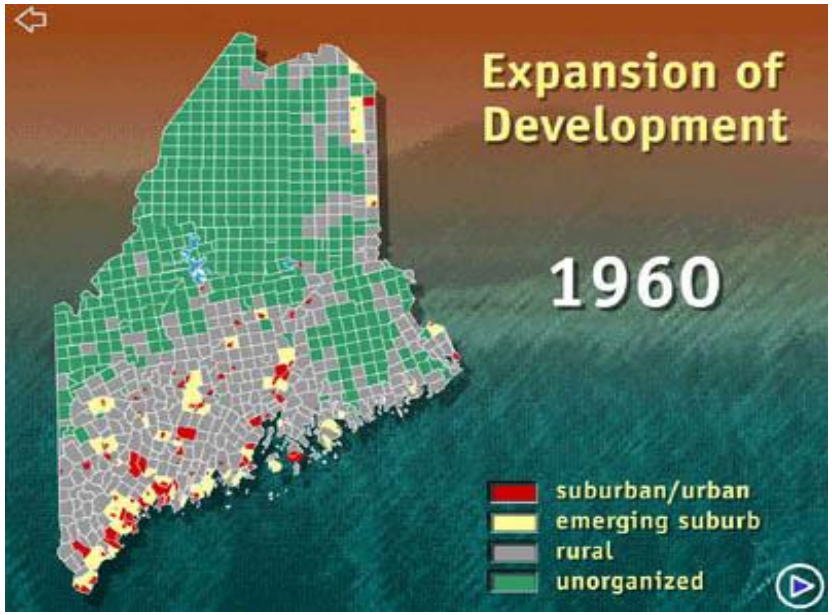
CHANGE

Maine Growth over the years

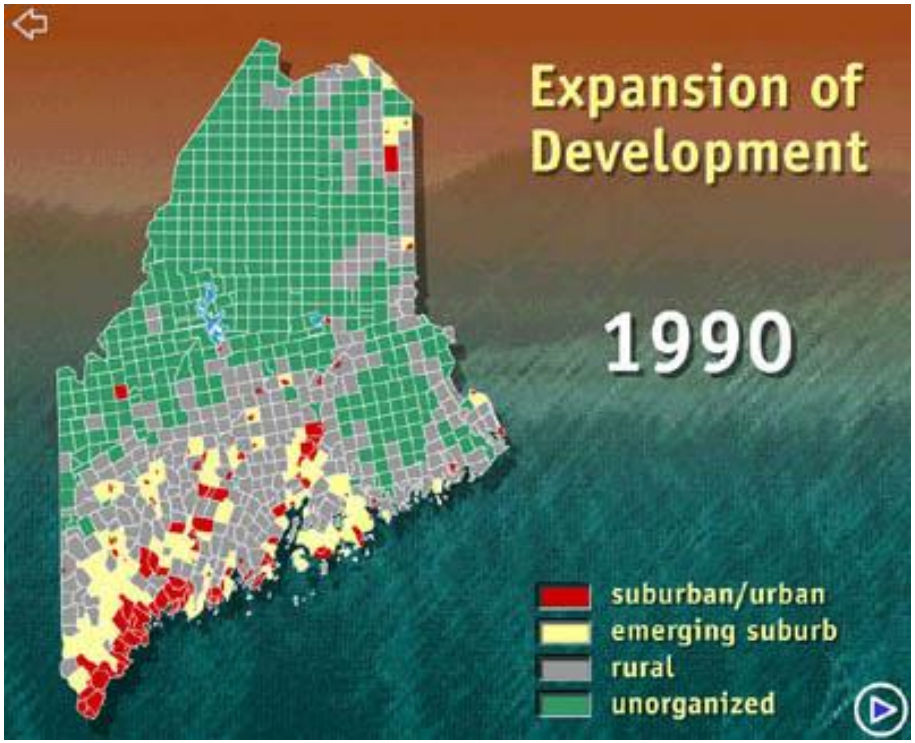
- 1860 620,000
- 1960 626,000
- 2010 1, 280,000
- 2050 2,000,000 projected

Maine Has Grown

0.626 million

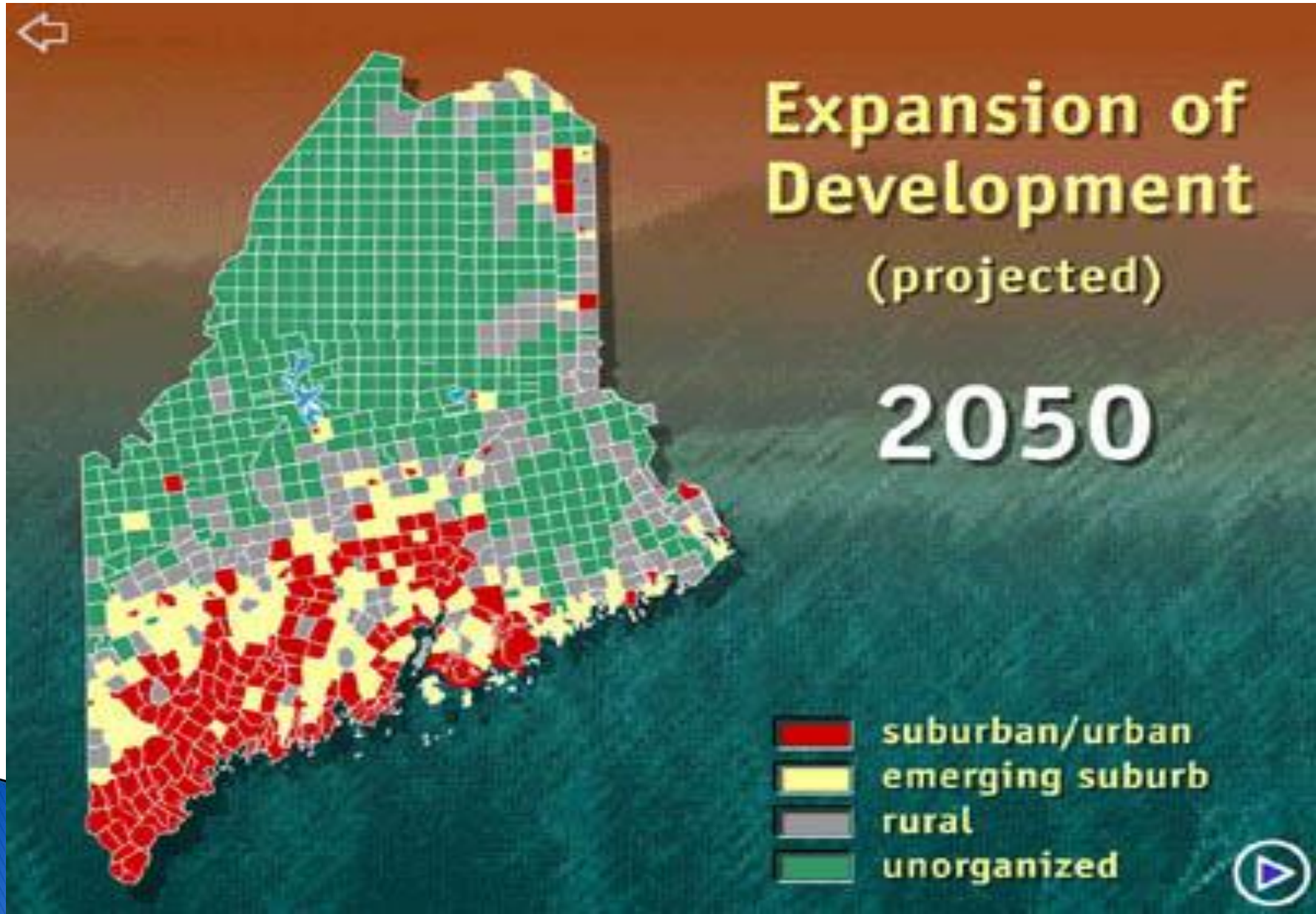


1.298 million



So What will Maine look like in 2050

Projected Growth for Maine



Acadia 2019

- 2003-2013 about 2 million visitors annually
- 2013- present about 3 million A million increase over a five year period
- July 5, 2019 35,000 in one day!
- Surge in Visitor Traffic that is taxing the infrastructure of the Park and local services.

  Carrying Capacity

Voice of Experience

- In 1958, I wish I knew then what I know Now


REGISTERED
MAINE
GUIDE
MASTER

CHANGE

Climate Change

- Actually it is here and we must adapt
- We all notice change as a constant
- Population growth
- Invasive species
- Fact is we are invasive
- However some invasive's are beneficial
- Best example European honeybee

Maine's Average Annual Temperature

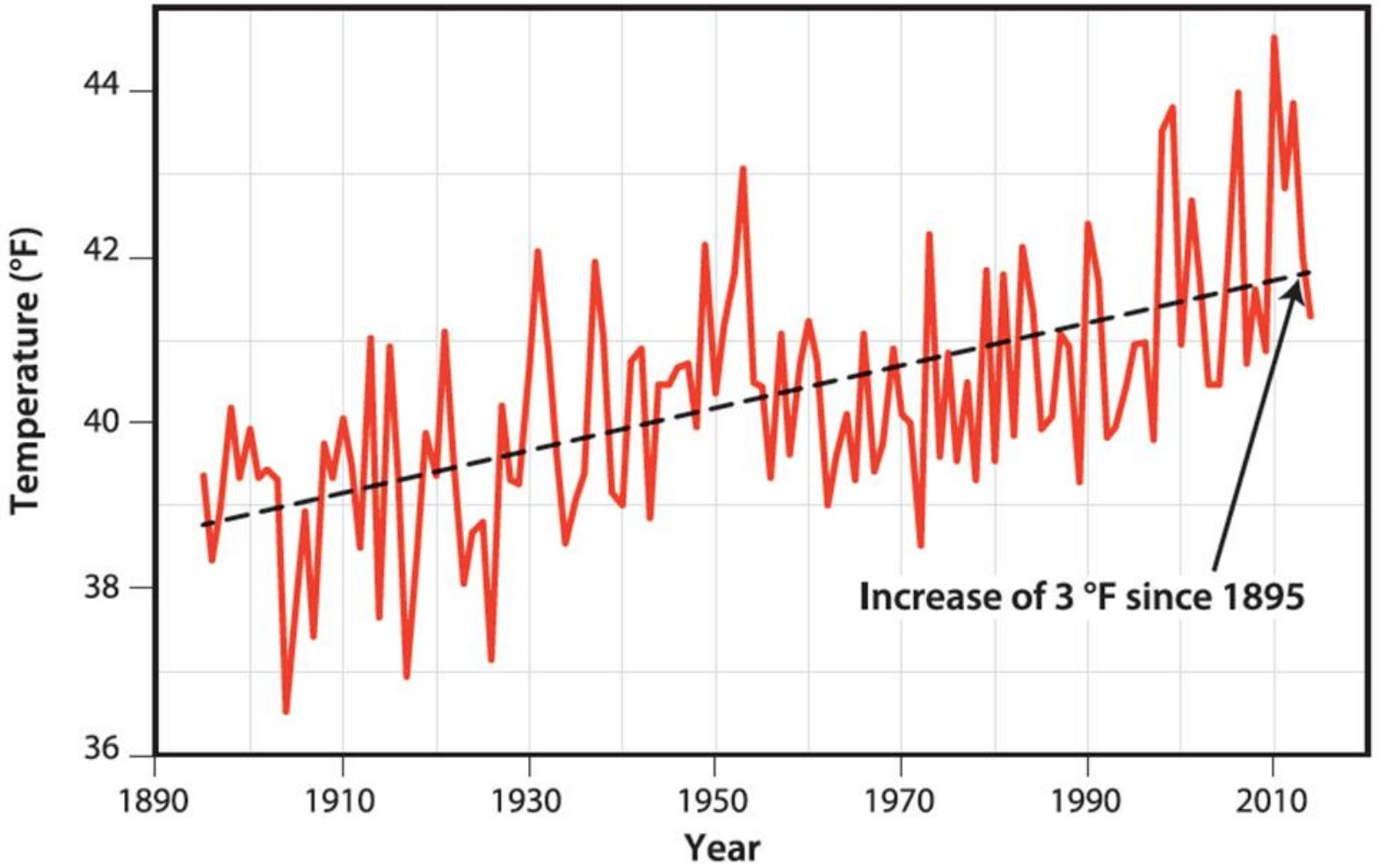


Figure 1. Mean annual temperature, 1895–2014, averaged across Maine from gridded monthly station records from the U.S. Climate Divisional Dataset (*ncdc.noaa.gov/monitoring-references/maps/us-climate-divisions.php*). A simplified linear trend (black line) indicates that temperature increased 3 °F over the record period.

Projected Snowfall Decline

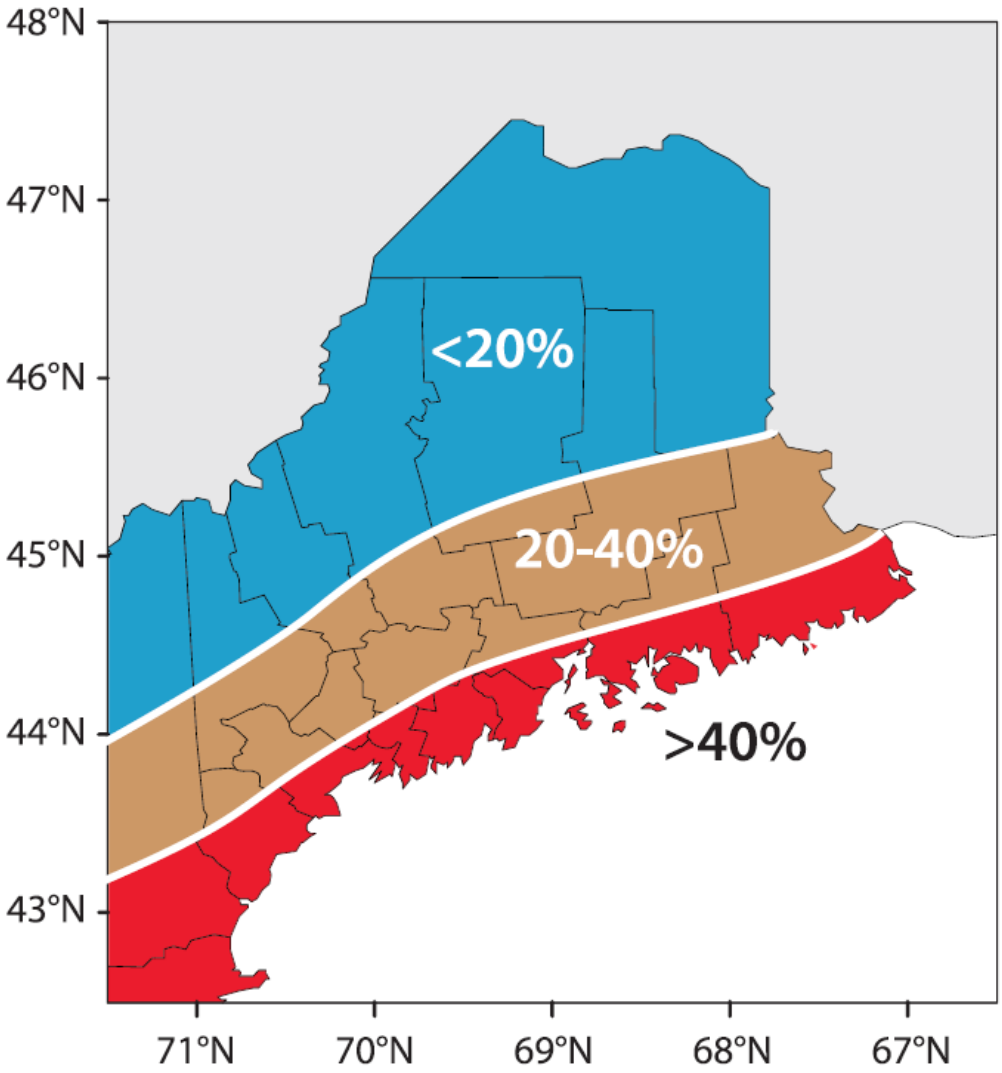
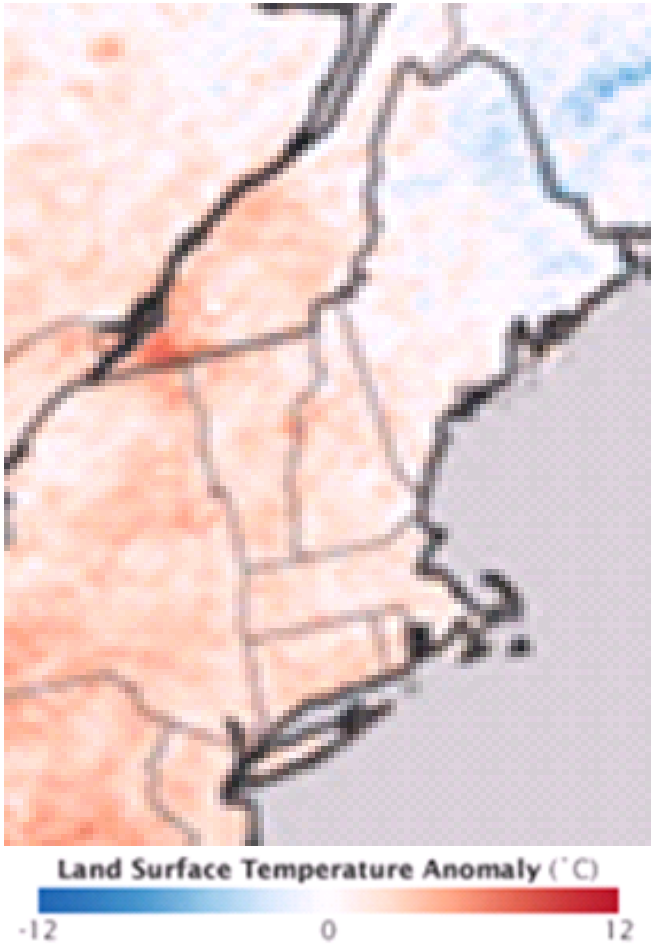
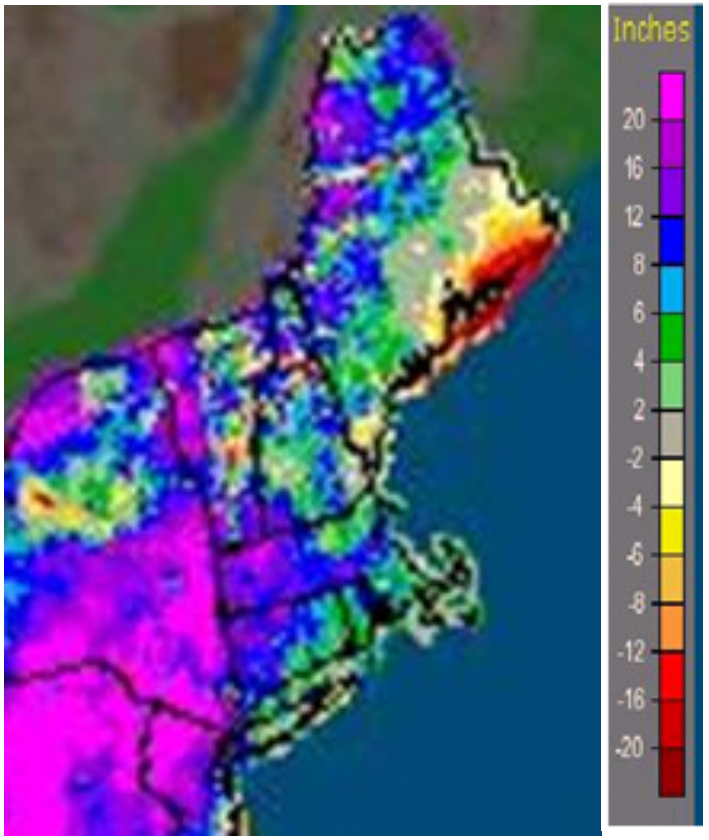


Figure 10. Map showing the predicted change or difference in total accumulated winter snow by climate zone from 1995–2014 to 2035–2054. The greatest changes are predicted to be along the coast, where many winters of the future will bring rain instead of snow. Map derived from an ensemble simulation of the IPCC A2 emissions scenario.


Land Surface Temperature Anomaly (˚C)
-12
0
12


Inches
20
16
12
8
6
4
2
-2
-4
-6
-8
-12
-16
-20

Change Is Happening

- Prevention and protection continues to be the best medicine for Maine Lakes.
- Invasive's are continuous threats
- The human footprint is here to stay.
- Adaptation is what we are faced with

The Drivers

- Landscape fragmentation from Development
- Septic tanks – waste disposal
- Agriculture activity via Fertilizers and some Pesticides
- Pollution from NPS, Roads and driveways
- Climate Change, bottom of the list

Endangered Species Act

Human Correlation with ES

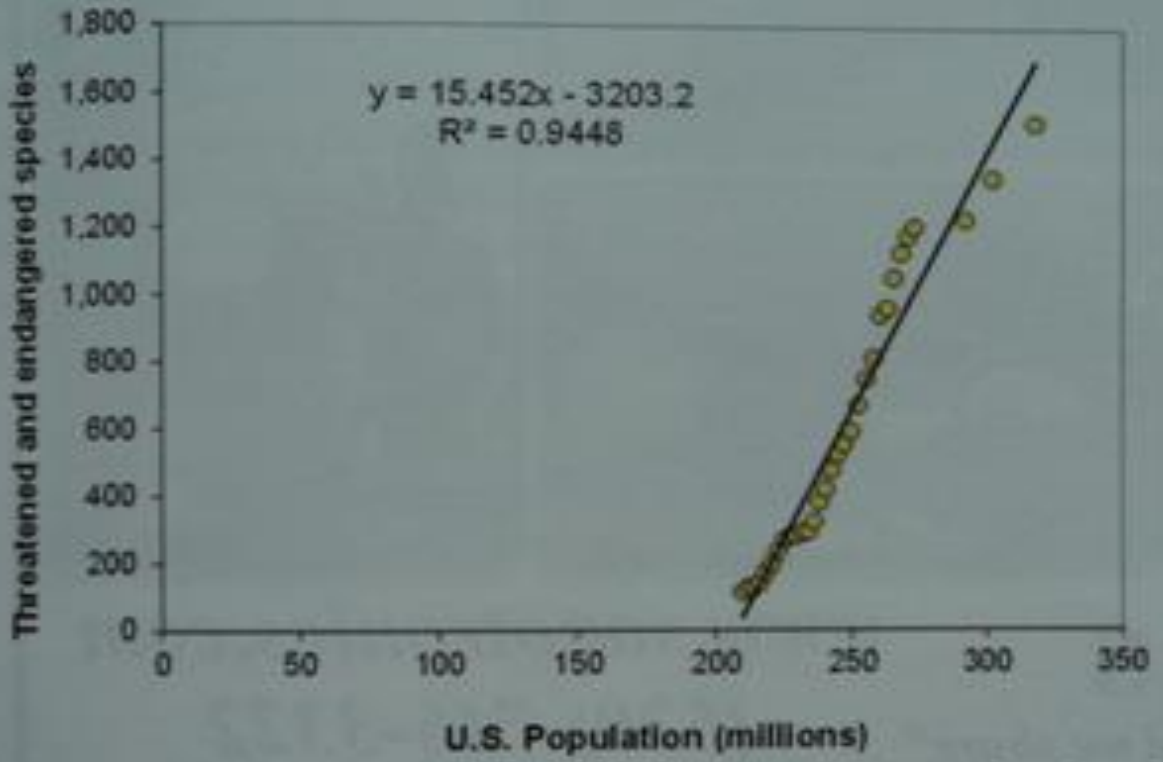


Figure 1. Number of threatened and endangered species as a function of population size in the United States (adapted from Limburg et al. 2011).

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CHANGE

THE MOST INVASIVE SPECIES OF ALL

Human kind

- Take a look in the mirror:

"We have met the enemy and it is us"
Pogo; ~ 1957

The Future

- Climate Change
- Toxics HAB's (Harmful Algal Blooms) Cyanobacteria (Cyanotoxins)
- Atmospheric Deposition – Heavy metals – Hg
- Invasive Species
- Polyfluoroalkyl and Perfluoroalkyl (PFAS) Chemicals for coatings and fire foams
- Adaptation?

Adaptation-North Pond Belgrade

Cold Stream Pond Summary

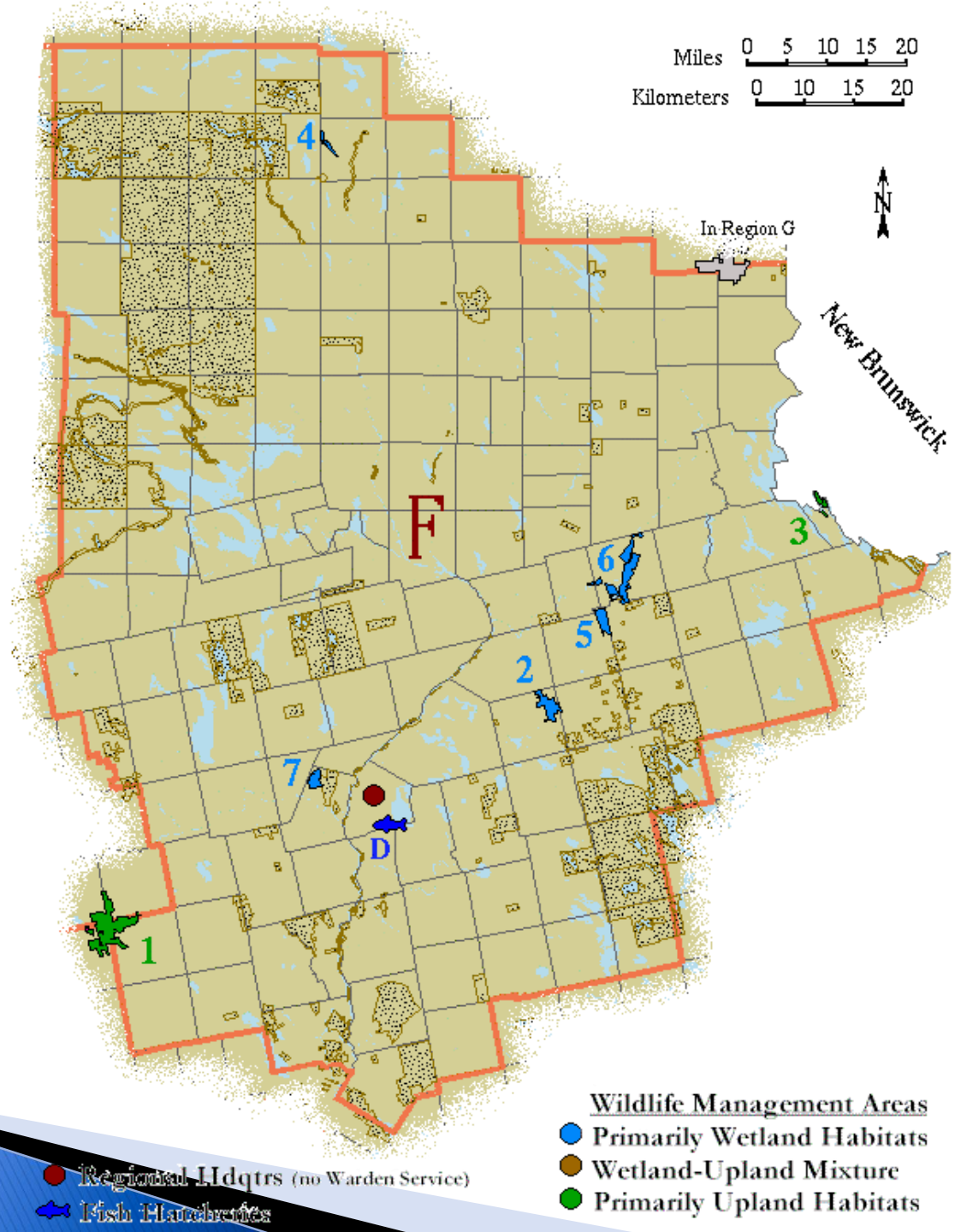
- It is a GEM lake
- It is on the DEP NPS list of 162 Lakes as priority of concerns
- It is a Sensitive Lake
- It has outstanding water quality
- CSP is the water supply for the Cobb Fish Hatchery.
- Therefor a Lake in need of protection

Where to Go for Help

- Linda Bacon DEP Lakes Limnologist
- 649-4238

- Kevin Dunham Regional Fisheries Biologist
- 732-4131

- Scott Williams LSM(VLMP) 783-7733


Miles 0 5 10 15 20
Kilometers 0 10 15 20
N
In Region G
New Brunswick
F
1
2
3
4
5
6
7
D
Wildlife Management Areas
Primarily Wetland Habitats
Wetland-Upland Mixture
Primarily Upland Habitats
Regional Hdqtrs (no Warden Service)
Fish Hatcheries

STORY TIME

- Cold Stream Pond
- My first visit was back in 1962
- The Cobb Hatchery water source is CSP
- Then a three year project on WQ in 1970

CSP Concerns

- Pipewort
- Muck
- Moss

QUESTIONS

Answers