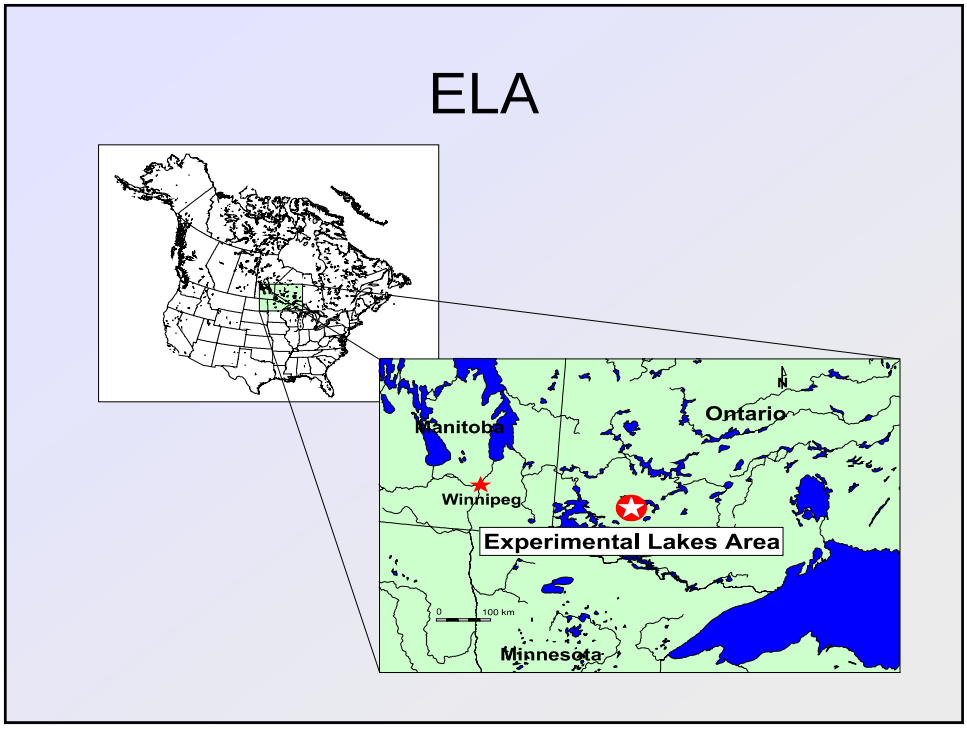
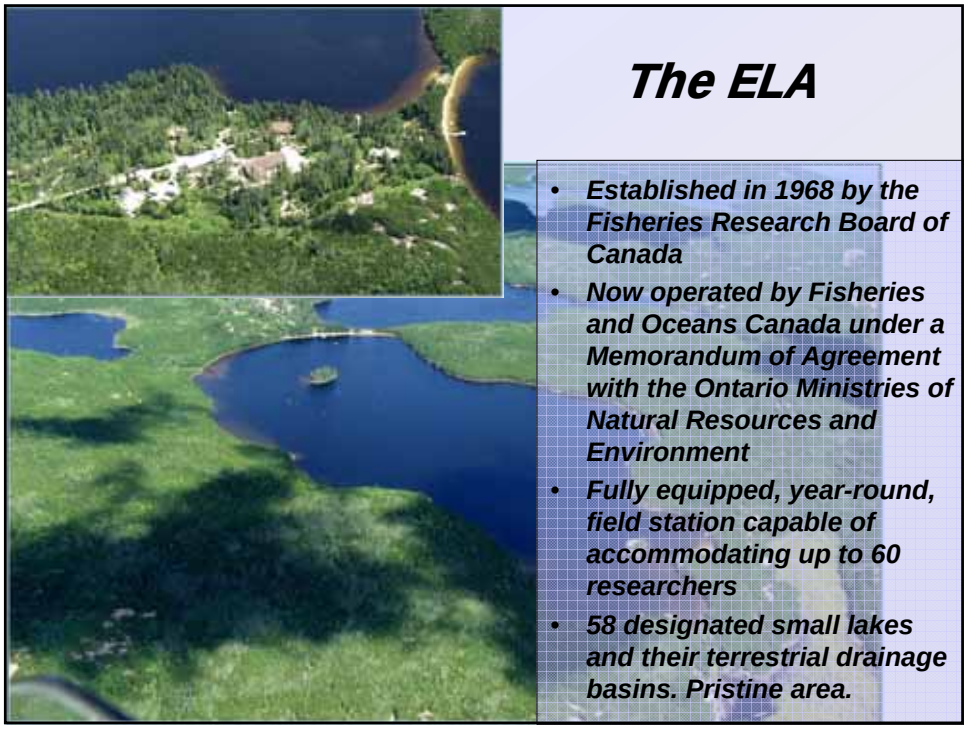

Introduction to the ELA
Aquaculture Experiment

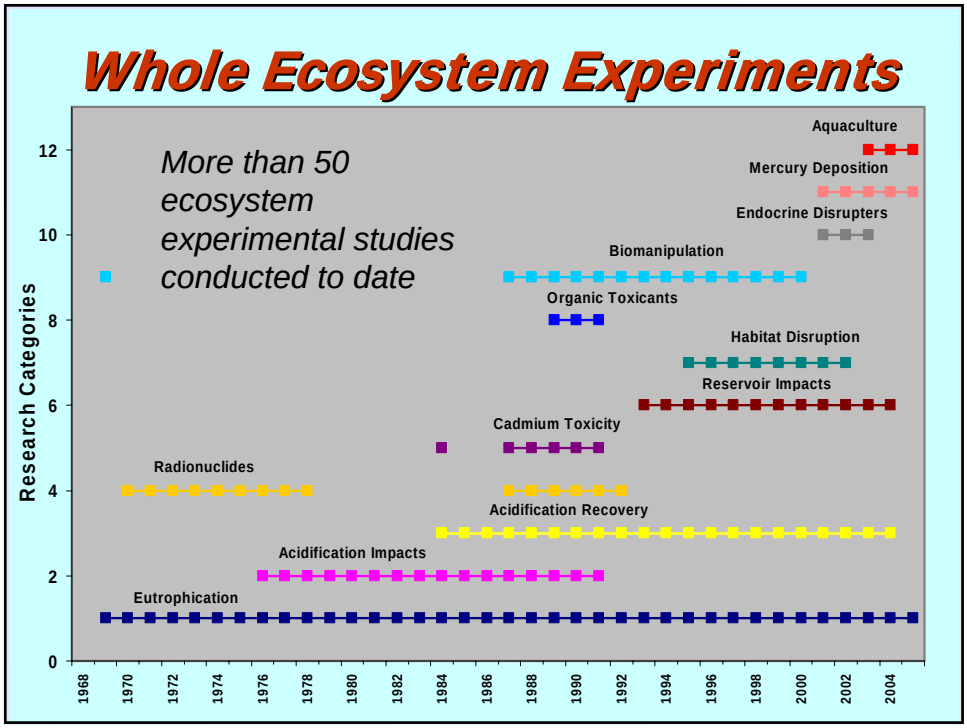

ELA
Manitoba
Ontario
Winnipeg
Experimental Lakes Area
0
100 km
Minnesota



The ELA

- *Established in 1968 by the Fisheries Research Board of Canada*
- *Now operated by Fisheries and Oceans Canada under a Memorandum of Agreement with the Ontario Ministries of Natural Resources and Environment*
- *Fully equipped, year-round, field station capable of accommodating up to 60 researchers*
- *58 designated small lakes and their terrestrial drainage basins. Pristine area.*

Whole Ecosystem Experiments



Why do aquaculture research at the ELA?

- Experimental design considerations
  - Controlled experiments possible
  - Smaller systems, uncomplicated hydrology
  - Pristine area: pre- and post-measurement
  - No confounding

- It is what we were designed to do….

ELA and Eutrophication Research

1965 - IJC recommends to G of C and US additional support for studies on pollution to GL

1968 - ELA Field research begins

1969 - Lake 227 fertilization experiment begins (still ongoing)

1971/72 - Addition of N and P to L304

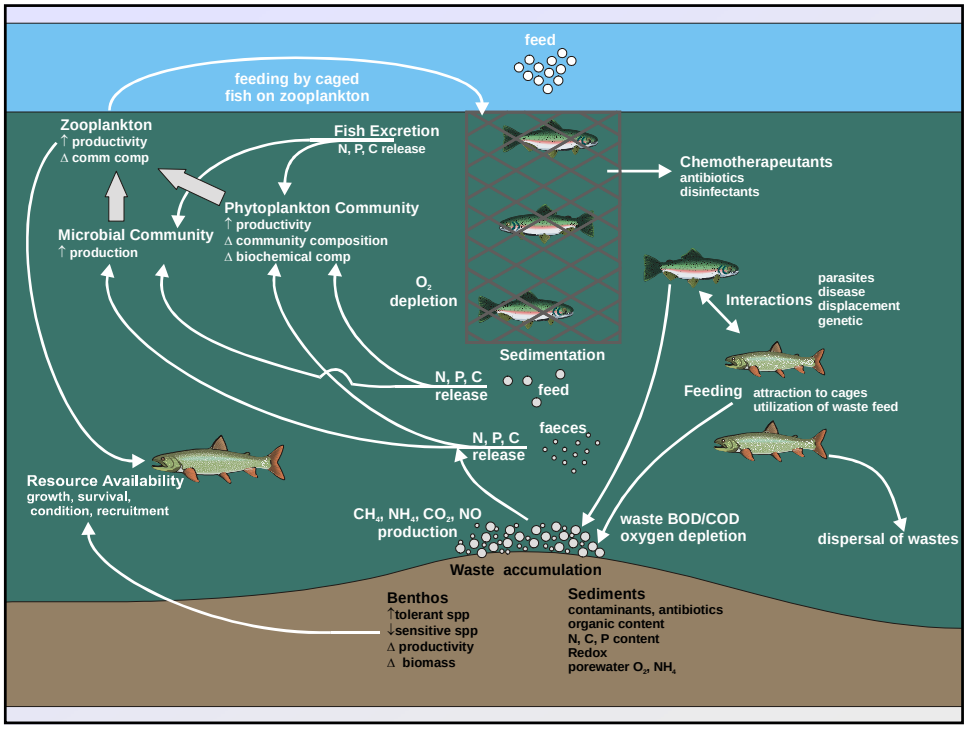
1972 – hypolimnetic P, N, C addition to 302N

1973 - L226 eutrophication experiment begins

1983 – L226 recovery study

"You're glumping the pond where the Humming-Fish hummed!
No more can they hum, for their gills are all gummed.
So I'm sending them off. Oh, their future is dreary.
They'll walk on their fins and get woefully weary
in search of some water that isn't so smeary.
I hear things are just as bad up in Lake Erie."
— The Lorax, by Dr. Seuss

7 lakes experimentally fertilized: 227, 304, 302, 261, 226, 303, 230



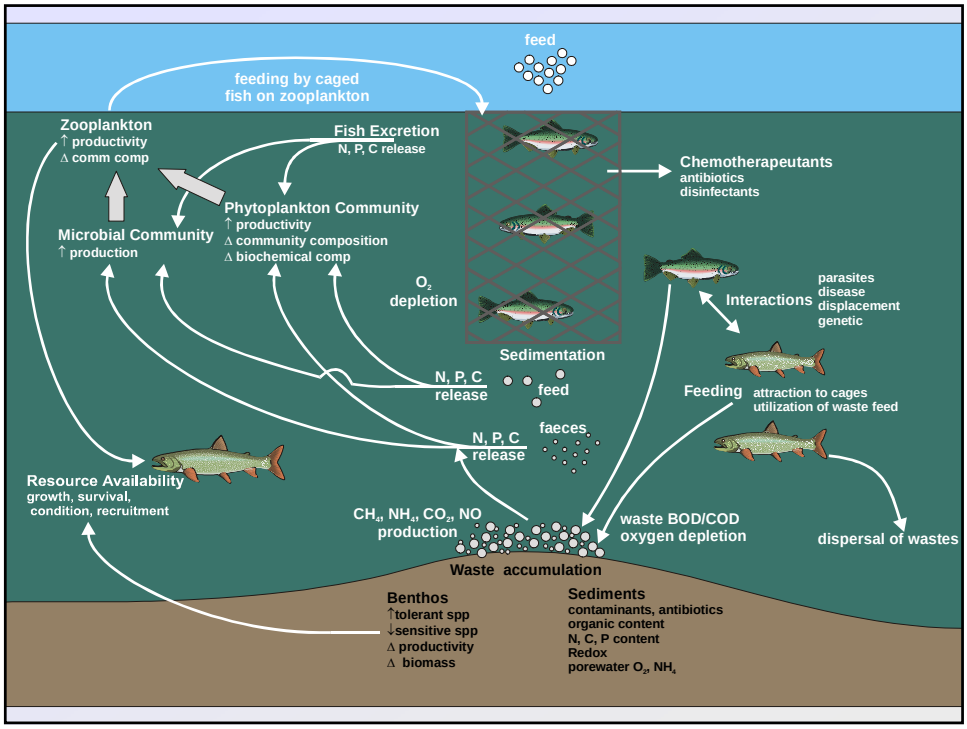
Lakes 375 & 373

•2003
•Single, 10m diameter pen in N basin of L375

•10 000 all-female rainbow trout

- Feed = Martin Mills Profishent
- 4 production cycles, June-November
- NOAA advising operational aspects of farm

	2003	2004	2005
# Stocked fish	10640	10249	9834
Initial biomass	94g	101g	197g
Final biomass (kg)	8489	9791	10159
Feed usage (kg)	8713.8	9671.6	11124.5
FCR	1.16	1.10	1.35
P loading feed (kg)	89.8	104.5	117.4
P removal fish (kg)	27.2	31.3	32.5
Net P load (kg)	62.6	73.2	84.9



Scaling

Site	Volume (m^3)	Fish Production (Tonnes)	Residence Time
L375	2695982	10	5.7 years
Lake Wolsey	263,910 000	295	215 days
Big Sound	3,200,000,000	1000	~ 3 years
North Channel	90,000,000,000	~1700	~2 years

L375 P Aerial loading rates:

2003 0.27g/m^2

2004 0.32 g/m^2

2005 0.36 g/m^2

L227 P Aerial loading rate:

0.34g - 0.48g/m^2

L227 addition:
Chlorophyll increased from 3.0 µg/L to 51.8 µg/L in 12 weeks
(Schindler *et al.* 1971)

L226 P Aerial Loading rate:

0.34 g/m2