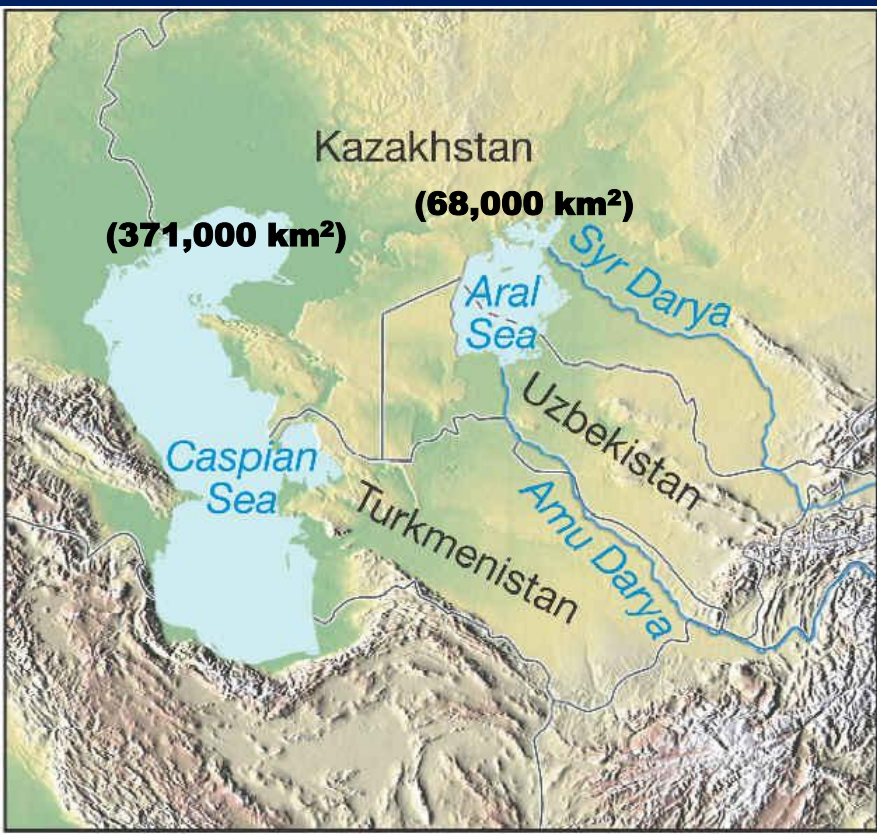




Lake level effects on Great Salt Lake ecosystem structure and function

GARY E. BELOVSKY

*Director, Environmental Research Center
University of Notre Dame*

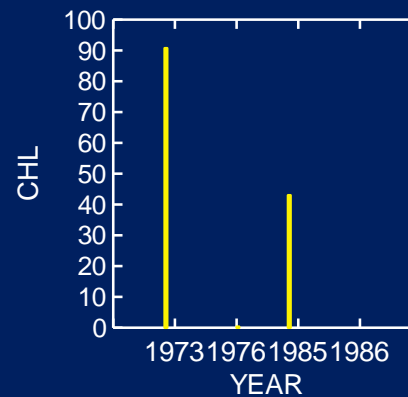
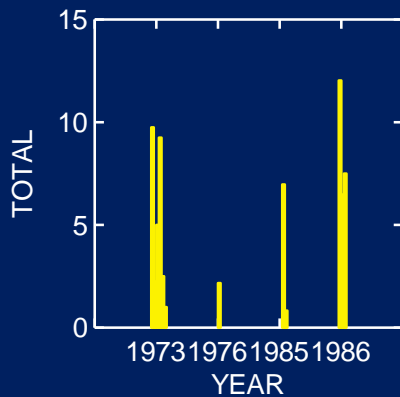
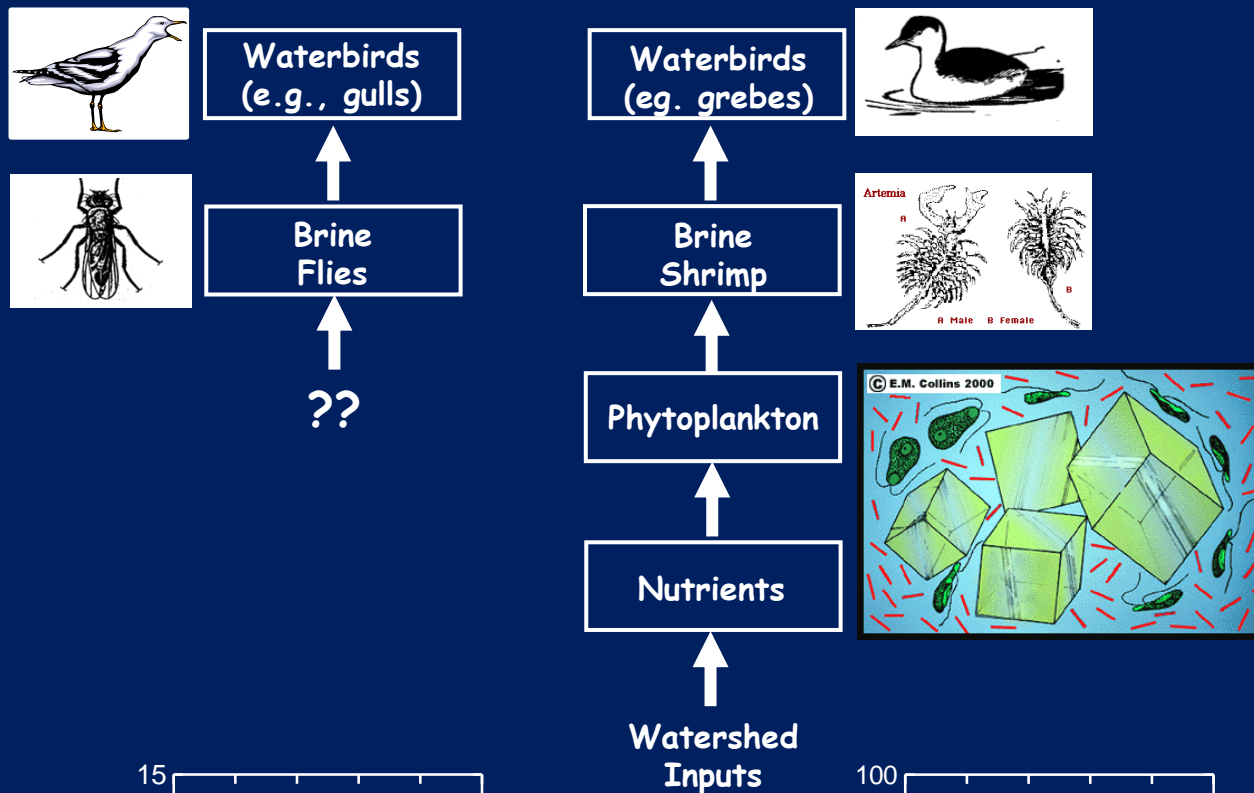


GREAT SALT LAKE:
the fourth largest
terminal, saline lake
in the world

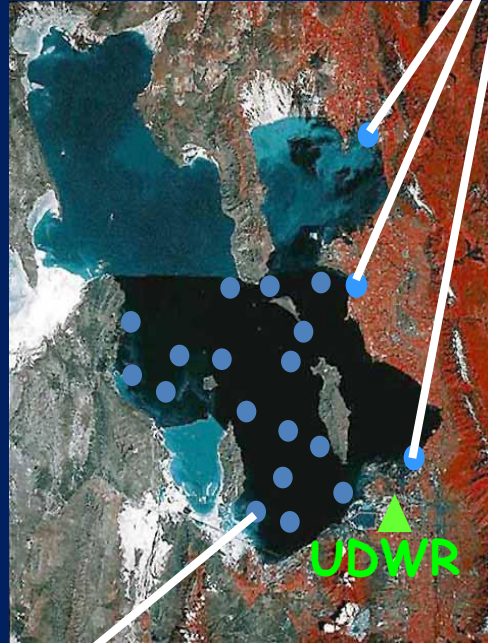



GREAT SALT LAKE
(4,400 km²)

WHERE GSLEP STARTED IN 1994



FIRST -- SAMPLE:



STREAM INFLOW SENSORS:

(three major streams)
Water inflow
Organic carbon
Particulates
Nutrients



EACH LAKE STATION:

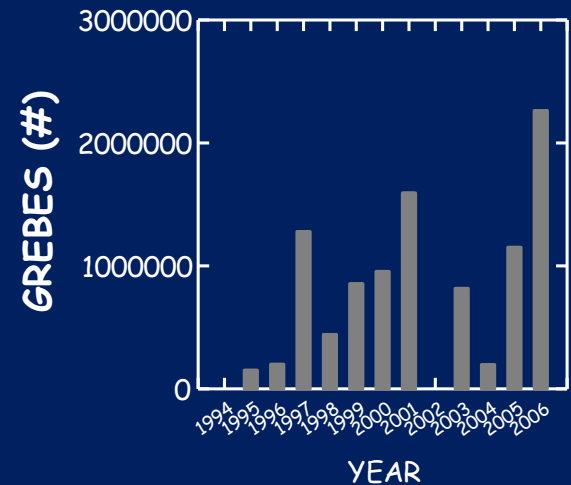
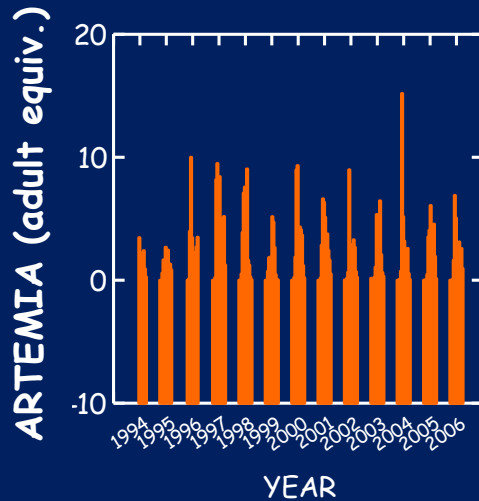
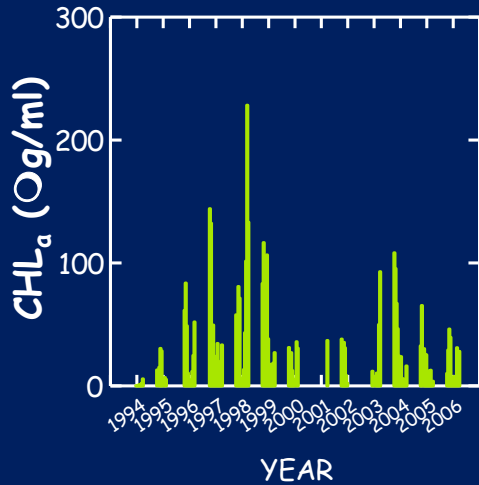
(up to 21 stations sampled)

Temperature
Salinity
Nutrients
Organic carbon
Particulates
Conductivity
Chlorophyll_a
Brine shrimp
Microbes (RNA)

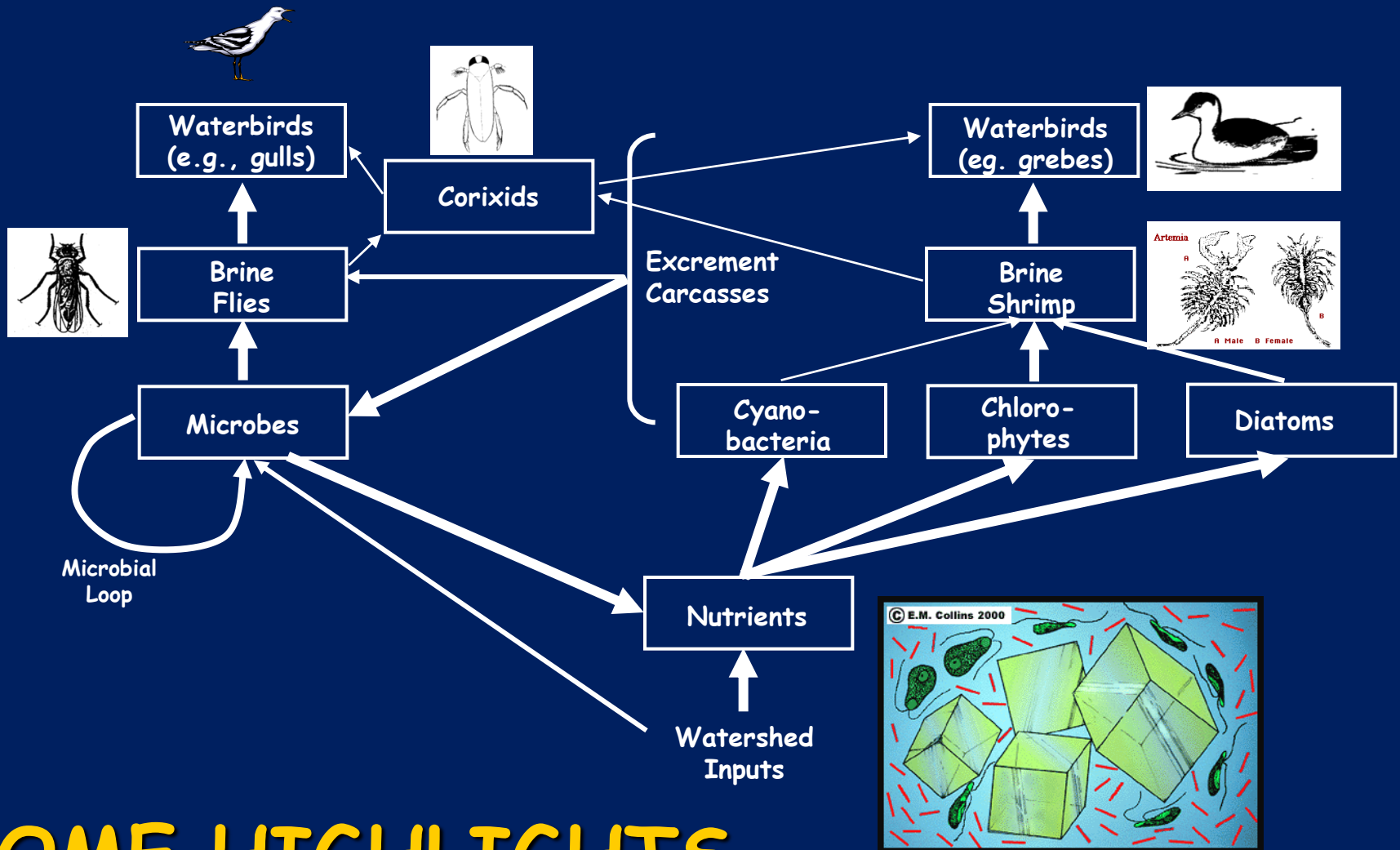
Sampling frequency

- Always, at all sites
- Usually, at some sites
- Sometimes, at some sites
- Never

SECOND -- SUMMARIZE DATA

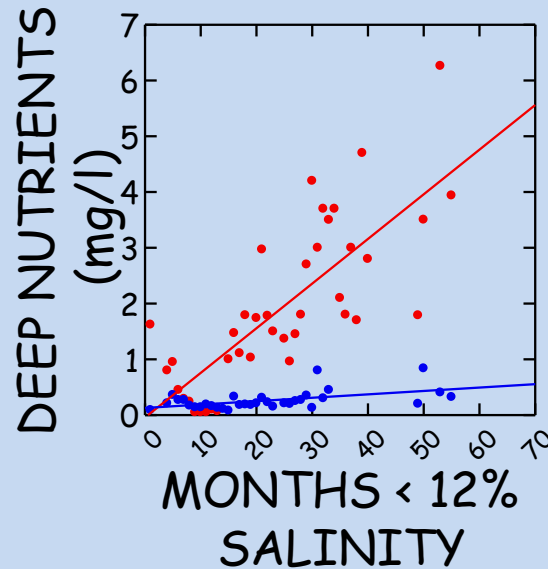
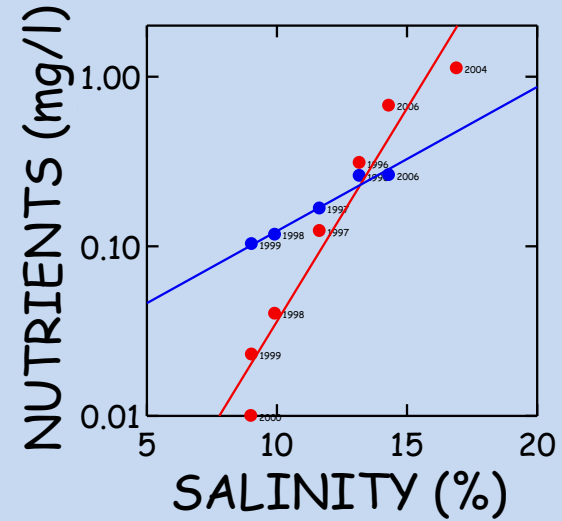
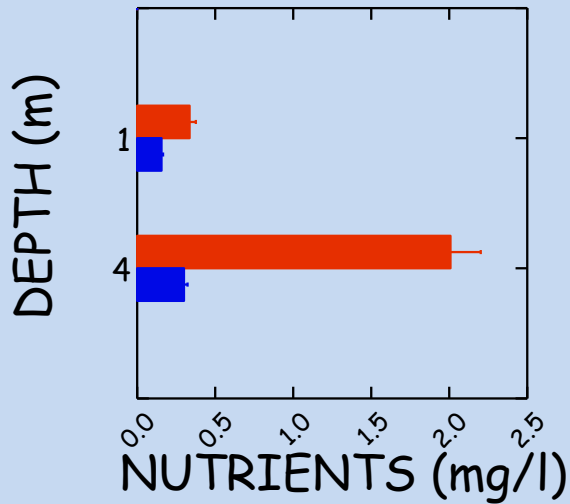


THIRD -- DESCRIBE GSL



SOME HIGHLIGHTS

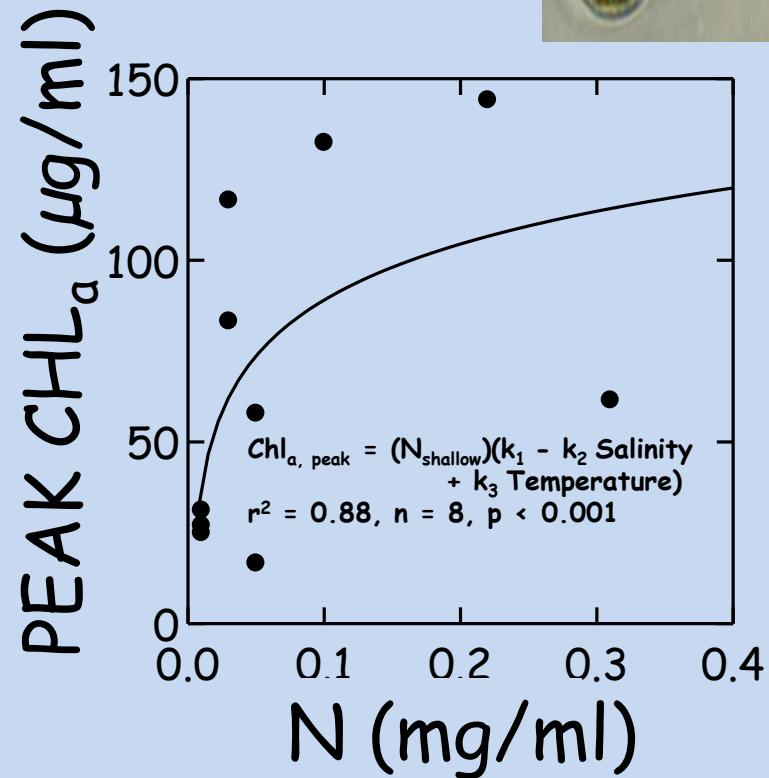
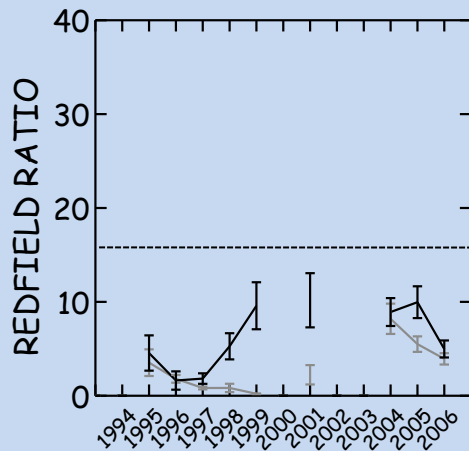
NUTRIENTS - the foundation



■ Nitrogen
■ Phosphorus

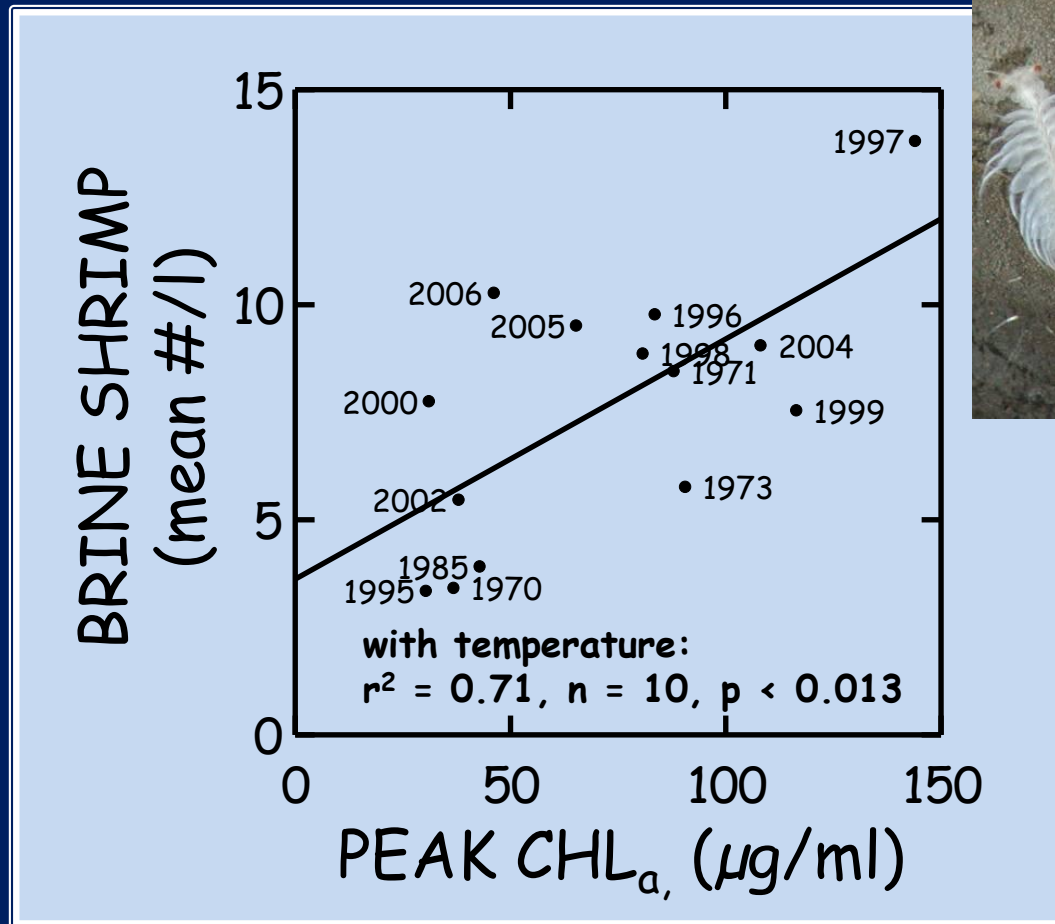


PHYTOPLANKTON -- respond to nutrients



SHRIMP AND FOOD RESOURCES --

Annual shrimp abundance increases
with peak phytoplankton production

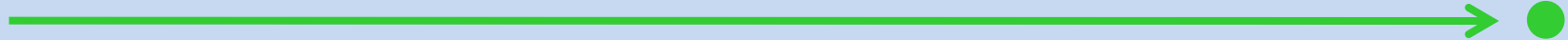


FOOD AND LIFE CYCLE



EGG _____ NAUPLIA _____ JUVENILE _____ ADULT _____ EGG

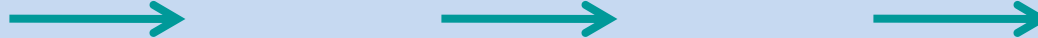
DUNALIELLA



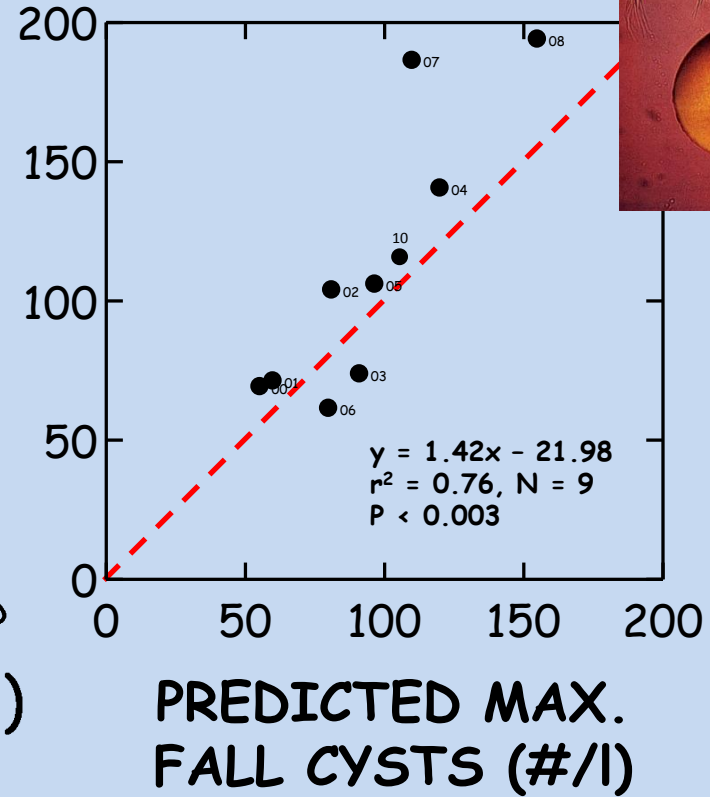
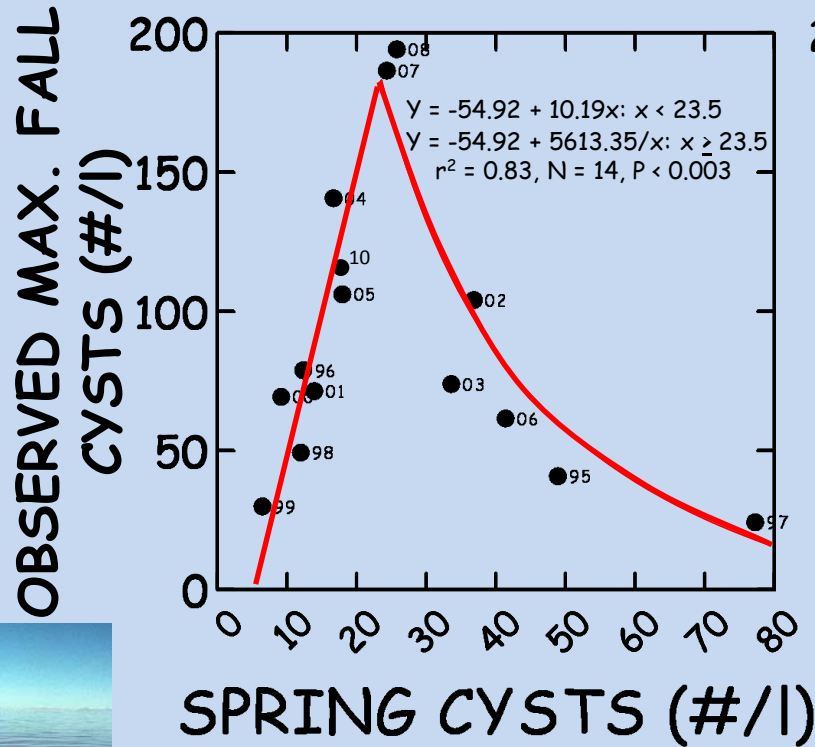
COCCOCHLORIS



NITZSCHIA



SHRIMP POPULATION RESPONSES - cyst numbers

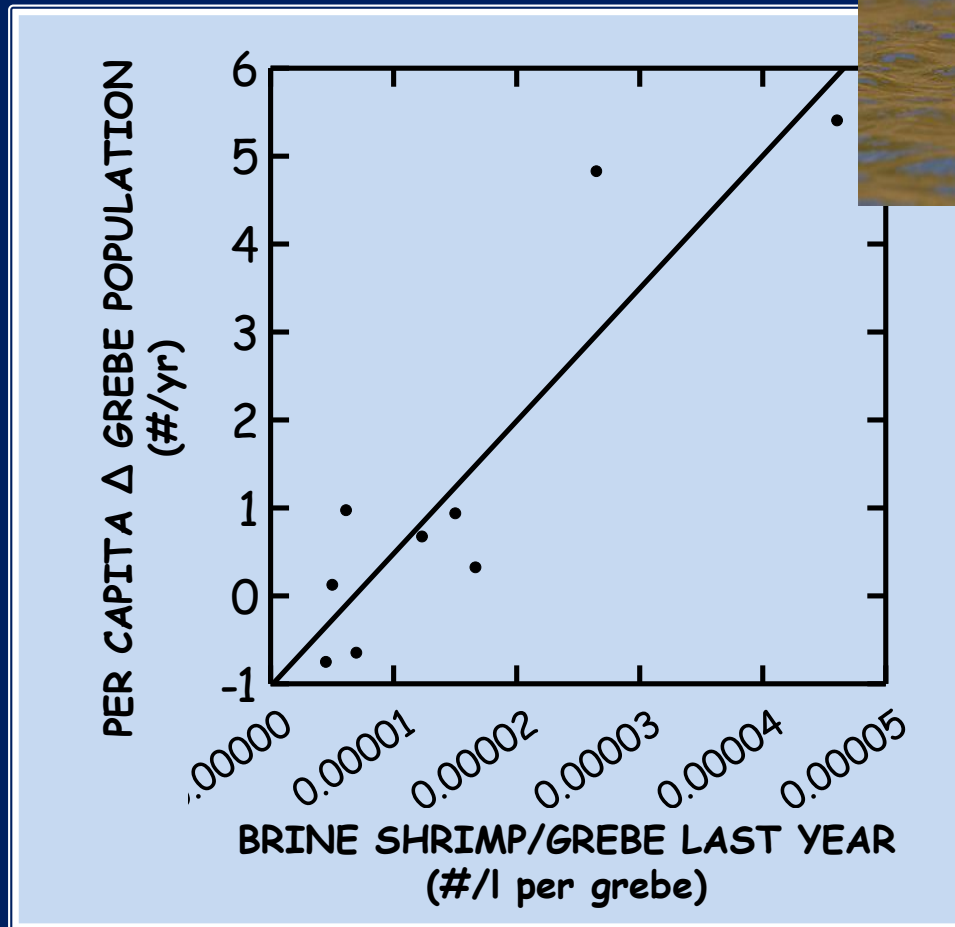


BASIS OF HARVEST MANAGEMENT



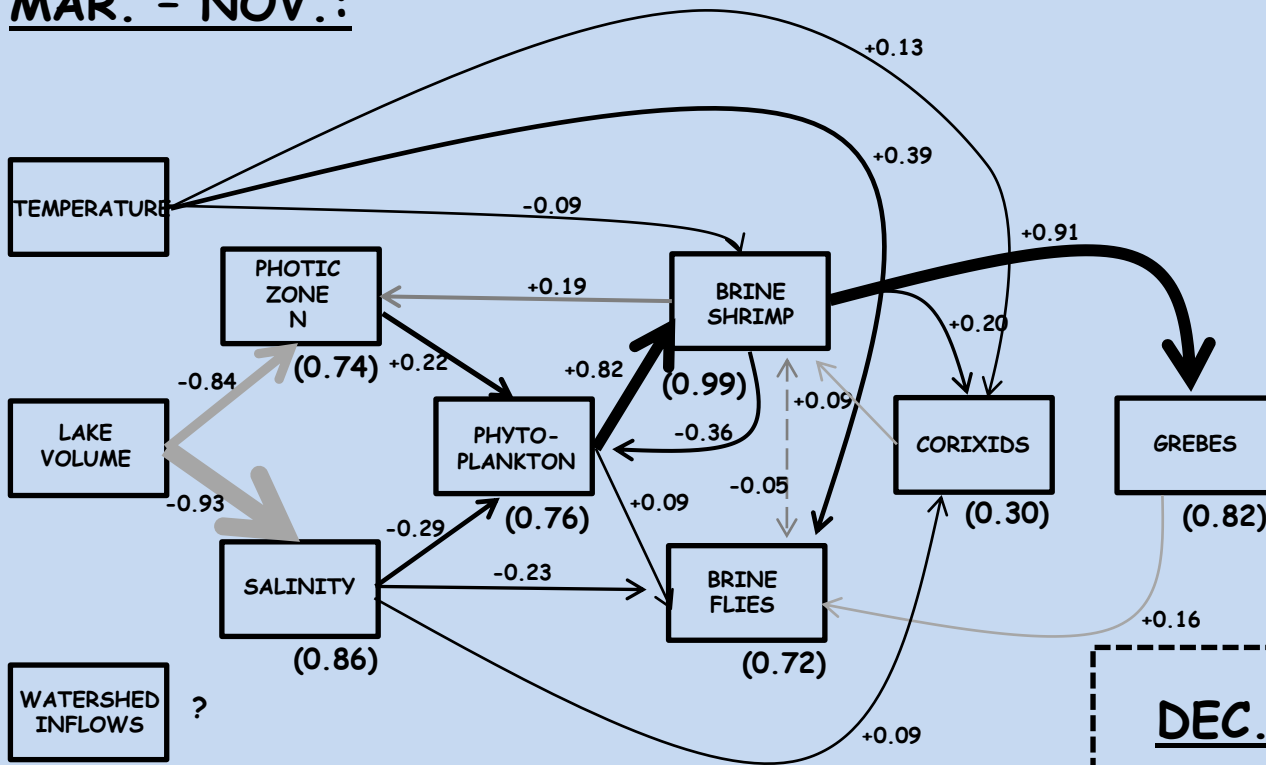
BRINE SHRIMP AND BIRDS

SHRIMP EXHIBIT NO RESPONSE TO GREBE PREDATION (+ effect, $P < 0.47$)

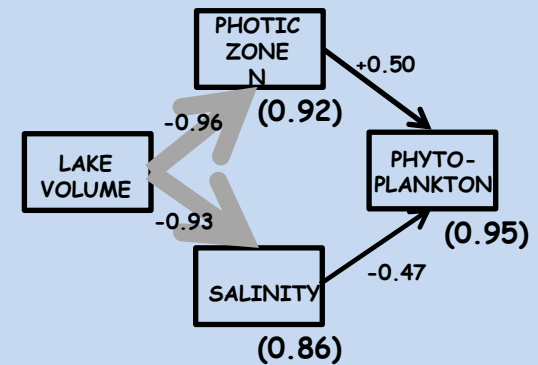


A SUMMARY - path analysis

MAR. - NOV.:

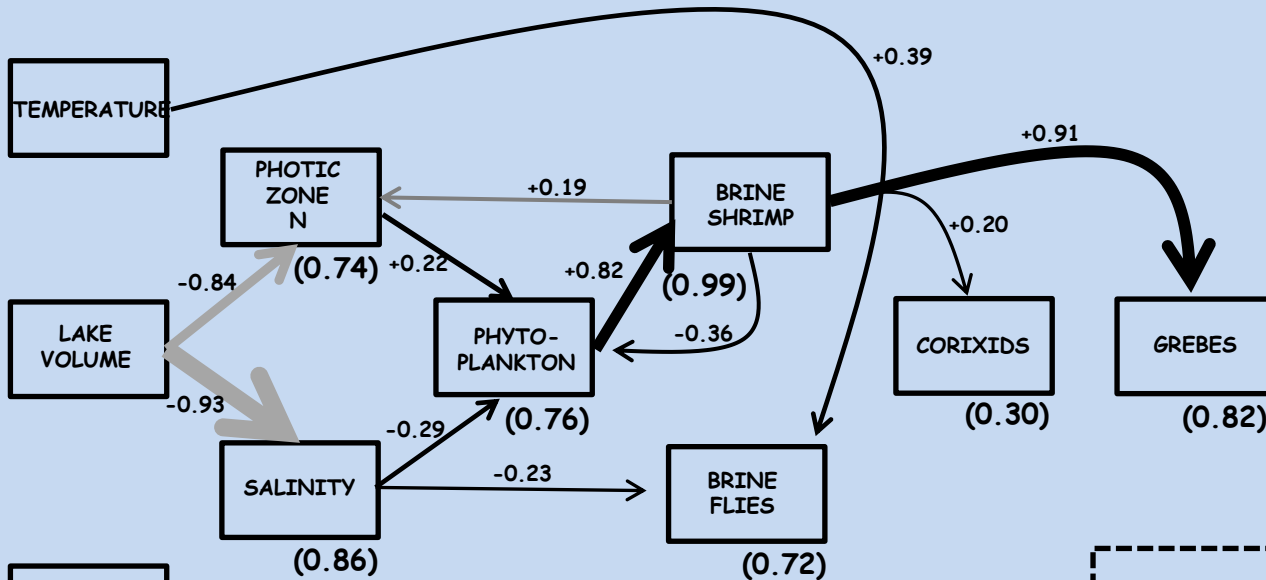


DEC. - FEB.:



A SIMPLIFIED SUMMARY

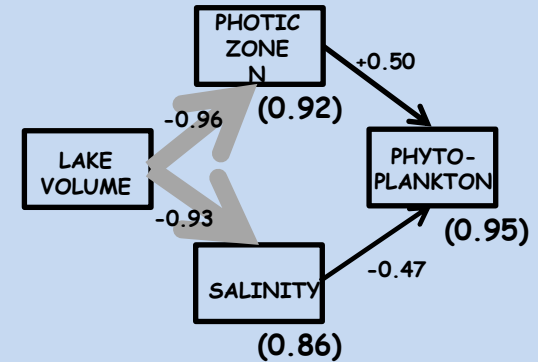
MAR. - NOV.:



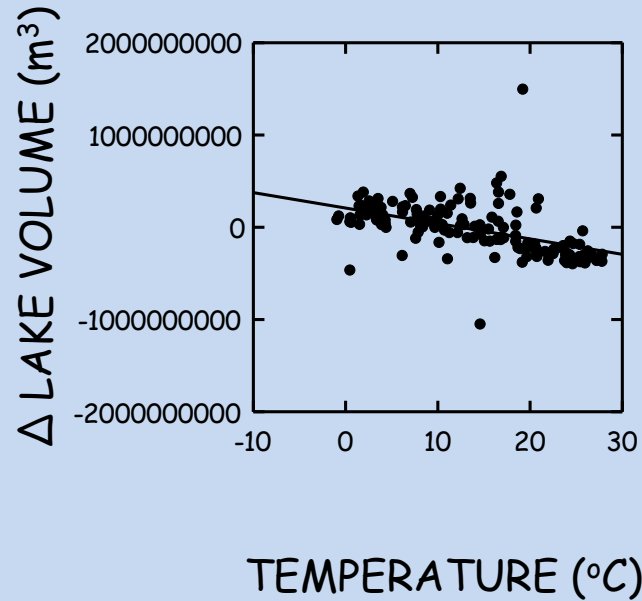
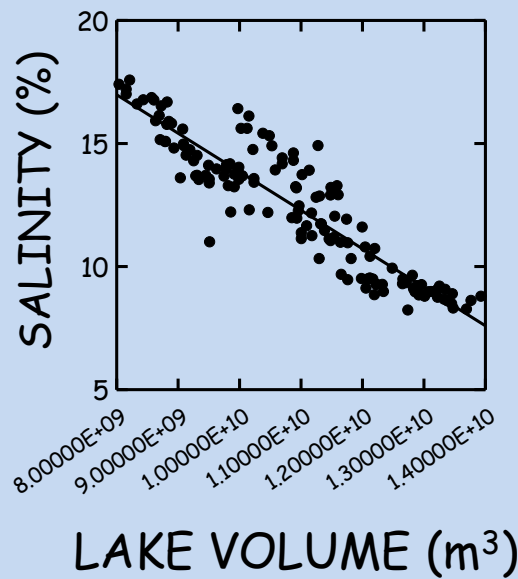
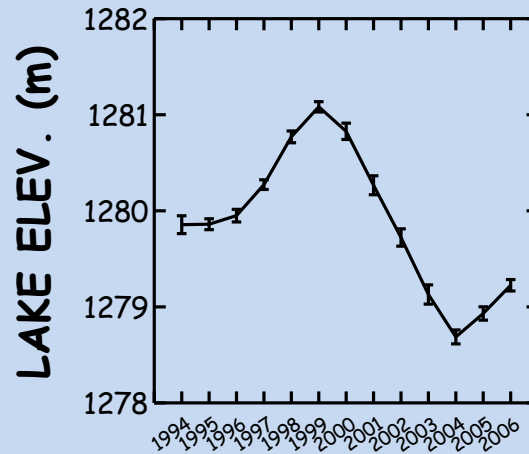
WATERSHED INFLOWS ?

DEEP BRINE LAYER ?

DEC. - FEB.:



THE OBVIOUS VARIATION

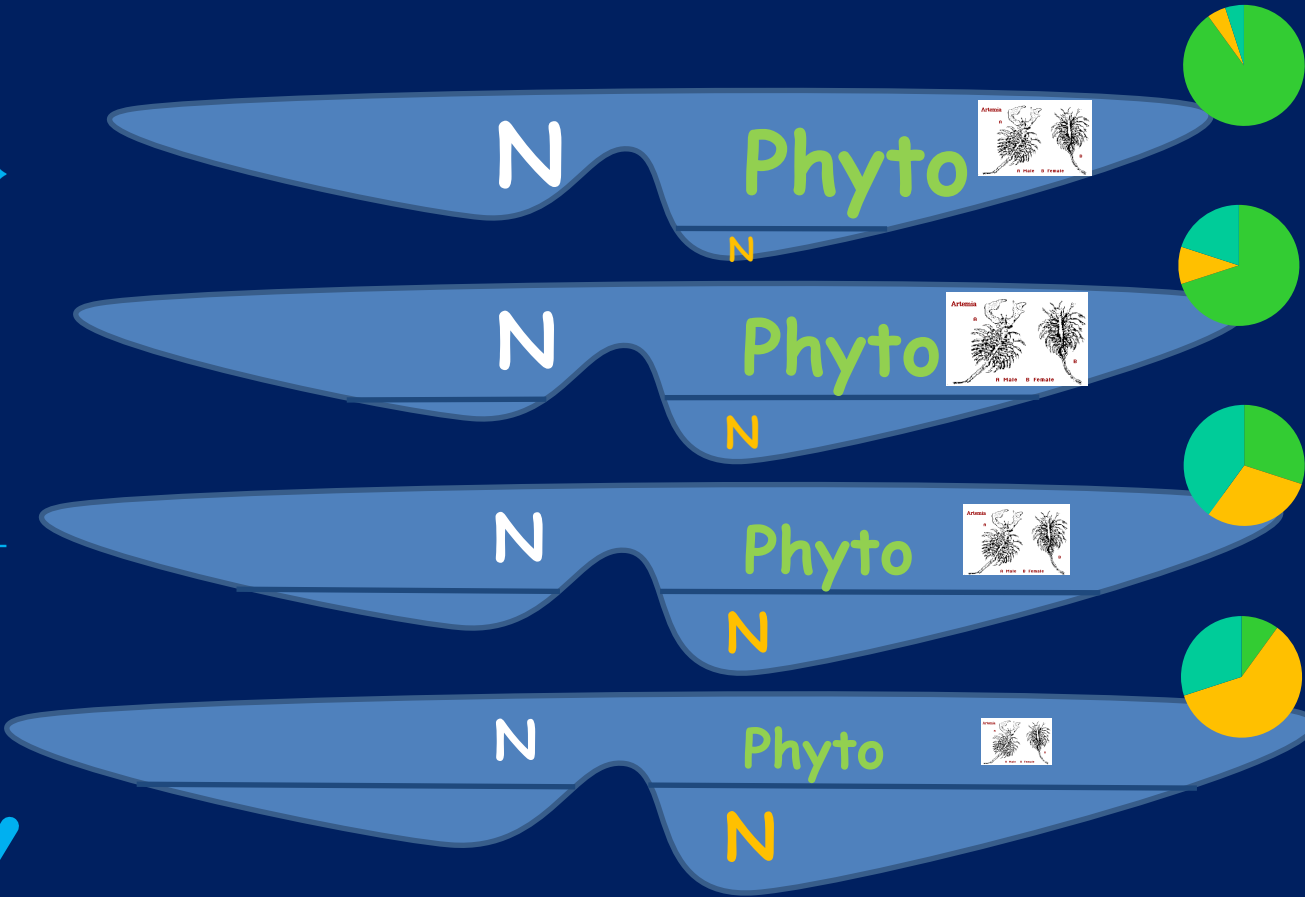


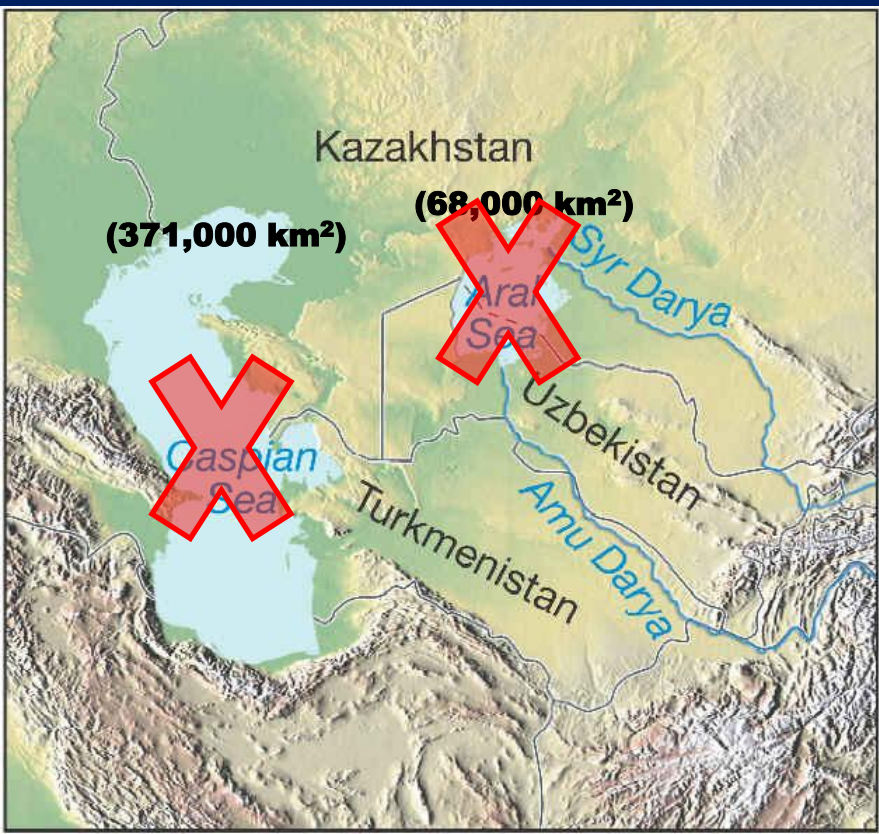
EFFECTS OF CHANGING LAKE LEVELS

(nutrient dilution, nutrient sequestration, salinity)



INFLOW ↑ or OUTFLOW ↓





GREAT SALT LAKE:
the fourth largest
terminal, saline lake
in the world -
THE ONLY ONE
LEFT!



GREAT SALT LAKE
(4,400 km²)

CAN WE PRESERVE THIS UNIQUE ECOSYSTEM?

