

Aeration + Anything else I can fit into my 40 minute time slot

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- ▶ www.kascomarine.com

Or – John Ewarts words.
We all need O2 or we are
screwed



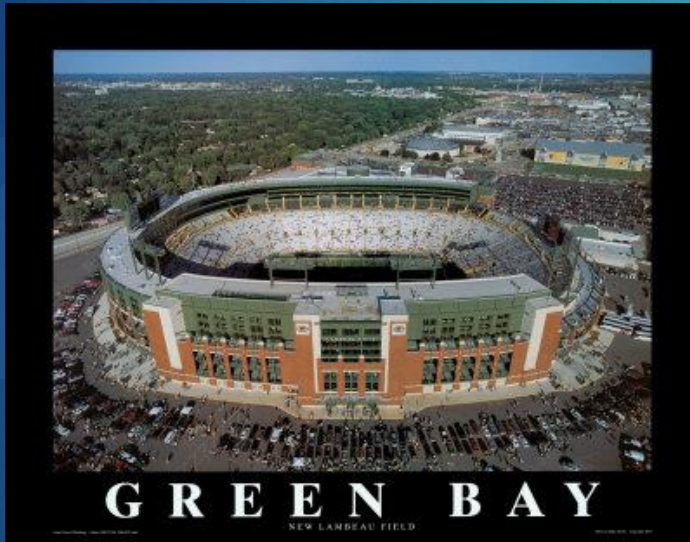
I Come from God's Country



This is what typically happens
when I talk. Hopefully not
today



World Champion Green Bay Packers






Jeff Hinshaw
NCSU
Mills River, NC



REDNECK MEASURING TAPE







Kasco
Marine, Inc.

AUG
85

5 Questions I am always asked by inquiring minds If I had \$100 for each time these questions were asked I could retire early

- ▶ What species should I raise?
- ▶ How many?
- ▶ What aerator I should use?
- ▶ How do I measure Dissolved oxygen?
- ▶ What level of D.O. is acceptable

Dissolved Oxygen Basics

- ▶ Dissolved oxygen is the single most important water quality parameter as it relates to overall farm profitability.
- ▶ On larger farms it is the #2 expense because of electrical consumption
- ▶ Manage it or FAIL!!

Oxygen demand in ponds

- ▶ 60% plankton
- ▶ 20% sediment
- ▶ 20% for the fish

Turnover Fishkill



Fishkill Plankton Crash



Fish kills can be prevented

- Algae crash



Fish kill from treating too much of a lake – D.O. crash



A photograph showing a large, dense pile of dead fish, likely white bass, on a muddy bank. The fish are silvery with some yellowish-brown discoloration, suggesting they have been dead for some time. The pile is situated next to a body of water, with bare, thin trees and branches visible in the background under an overcast sky. The overall scene depicts a significant fish mortality event.

Winter kill

O₂ is a problem when the fish want to hop on the grass



Warning signs - fish piping



Why can't he keep fish over winter – look at ppm on O2 meter closely



Don't want to plant your fish



Control of off flavor



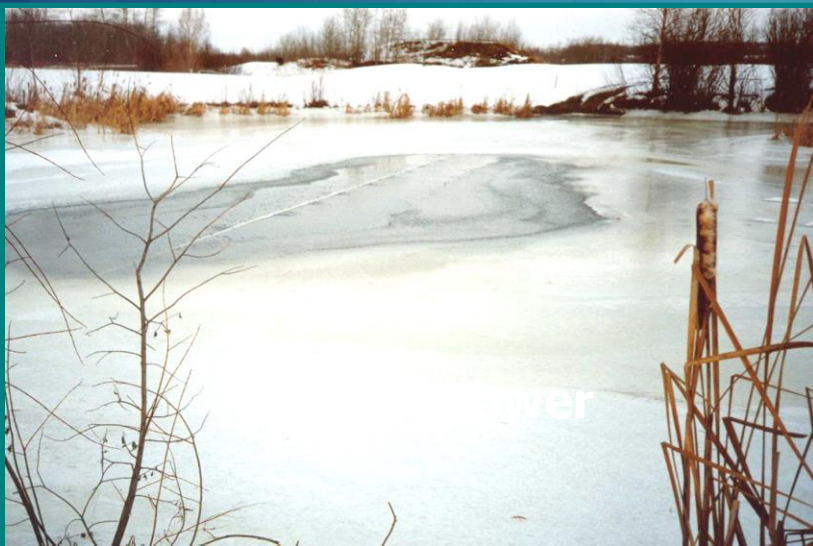
- ▶ Algae blooms and die offs will be less severe
- ▶ CO₂ shift
- ▶ O₂ to the bottom for benthic organisms to consume organic material
- ▶ Increase oxidation
- ▶ Complements other treatments (chemicals, bacteria, etc)
- ▶ Odor control
- ▶ Vent and/or eliminate H₂S, CO₂, and Methane
- ▶ Prevent thermal stratification and turnovers

Water Quality

- Oxygen Requirements
- Winter / Summer kill
- Testing equipment



Water Quality - Aeration



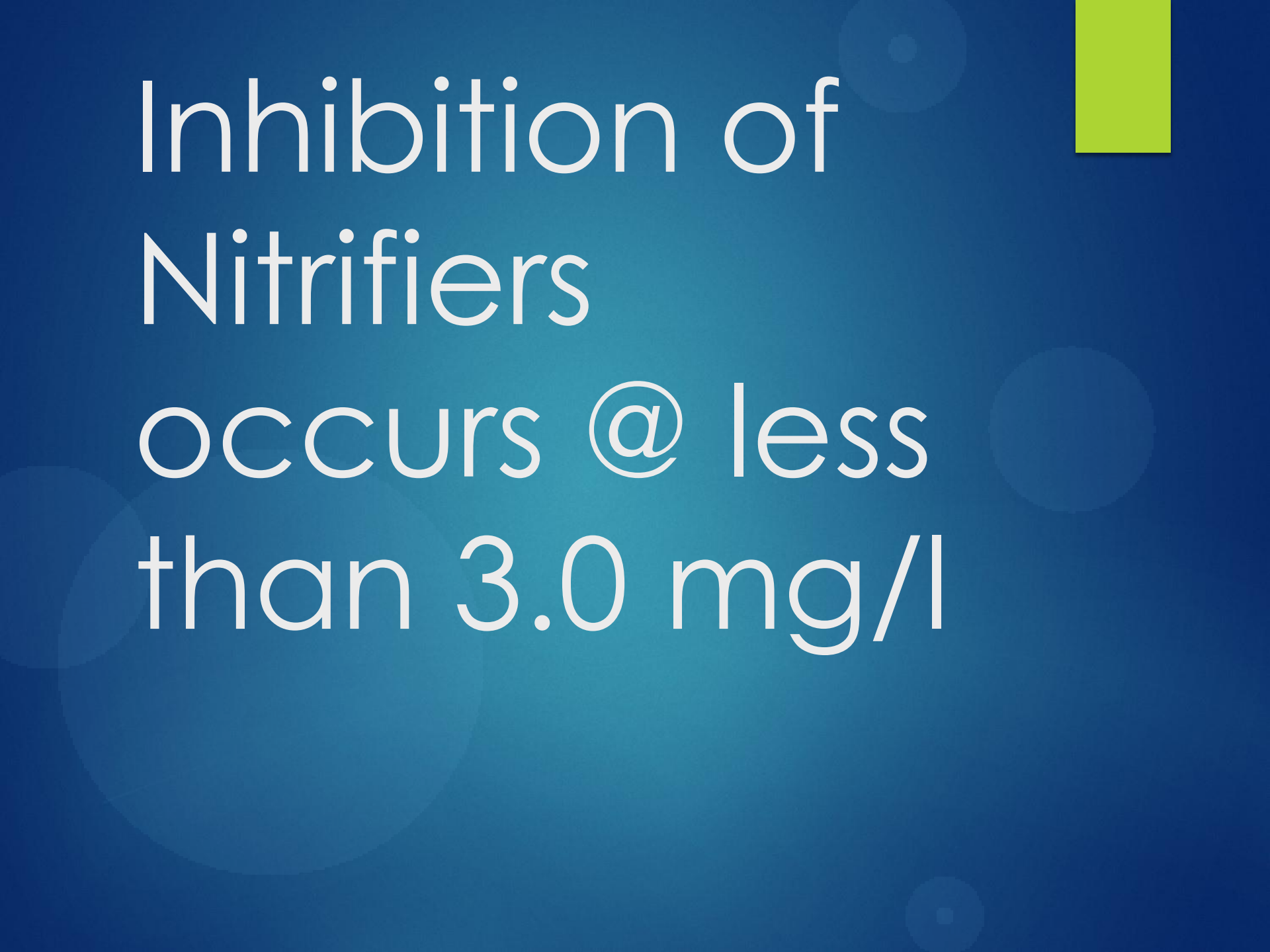


WHY USE AERATION

- Water Quality can be improved
- Organic Muck decomposition on the bottom can be sped up.
- Some P can be controlled.
- Potential control of mosquitoes
- Push Algae to the sides
- Shift Algae species composition
- Algae blooms will be less severe







Inhibition of
Nitrifiers
occurs @ less
than 3.0 mg/l

How Much O₂ is necessary? Two Approaches

- 1) base on feeding. Dr. Boyd says 1 #/ feed requires 1 # o₂/day. Keeping in mind that fish can consume of to 13x's as much O₂ when stomachs are full.
- 2) Average Consumption method: .02 - .05 lbs/ o₂/hr/100#'s of fish

Pond aeration two theories

- ▶ Feed the gain. Aerated to get fish to harvest faster. Shorten the risk.
- ▶ Aerates to increase density and more pounds per acre



What our aeration can do to fish growth. UN of FL study



Average O₂ Species consumption Expressed lbs/o₂/hr/100 lbs fish

Warm Water Adults - .03

Warm Water Juveniles - .05

Cool Water Adults - .025

Cool Water Juveniles - .04

Cold Water Adults - .03

Cold Water Juveniles - .02

Three Types of Pond Production

- ▶ Extensive: 50-500 lbs/A. Predominantly when land is cheap or electricity is not available
- ▶ Semi-Intensive: 1000-4000 pounds/A
- ▶ Intensive: Ranges to 10,000+ lbs/A – Small ponds and cheap electricity.

Target D.o.

- ▶ Do not let it get below 3 pm at 6 AM - Les Torans research
- ▶ Diurnal fluctuation
- ▶ Small fish stressed with wide fluctuations

Pure Oxygen Threshold

- ▶ Somewhere around $\frac{1}{2}$ # of fish per gallon of water.
- ▶ Densities as high as 1.9 # of fish per gallon of h₂O







Confusing Topics

- ▶ SOTR expressed as Lbs. of O₂ per Hp per Hour
- ▶ GPM
- ▶ HP
- ▶ 230V vs. 120V (volts x amps = watts)
- ▶ Single Phase vs. Three phase

Oxygen transfer tests

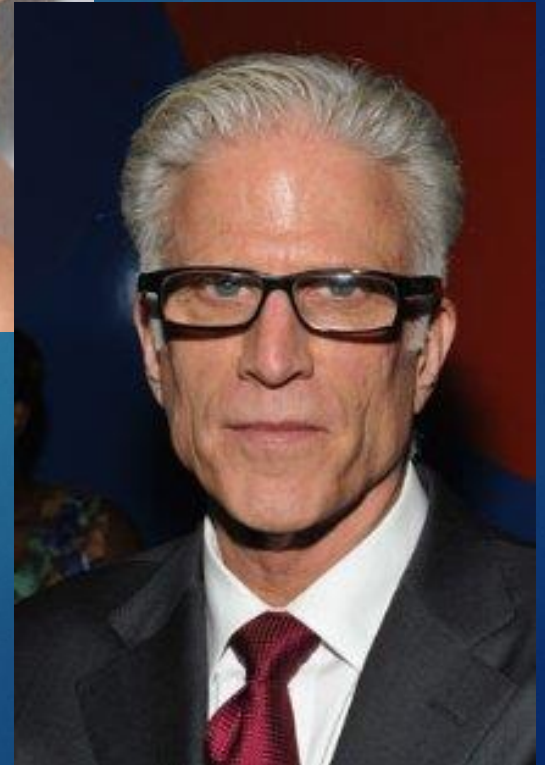






The BIG Miracle Movie

Kristen Bell, Drew Barrymore, John Krasinski, Ted Danson

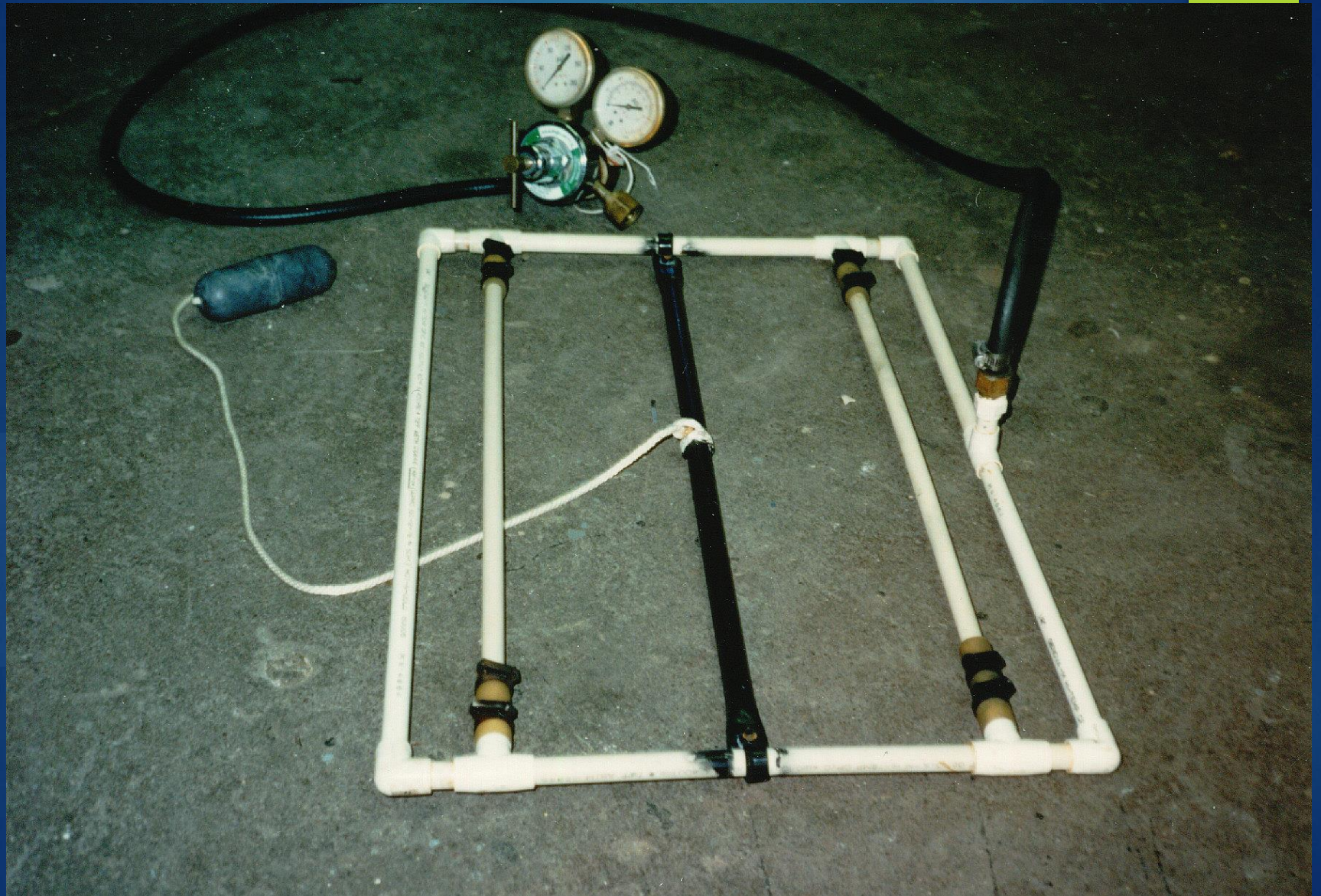
















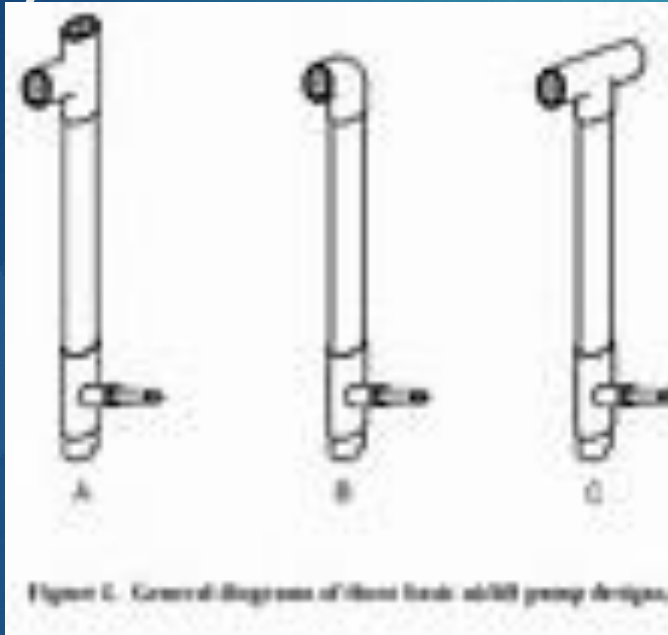
Fish consume up to 5 X's
o₂ when feeding







Airlifts employ high volume low head air pumps – two styles













Clogging and cleaning



Lose Warm water reservoir



Diffuser freeze ups in Winter





Winterkill prevention – diffusers 12' depth



Surface aerator in Winter – run all the time



Increase feeding



Solar







Alternative energy come a long way but has a long way to go – false sense of security



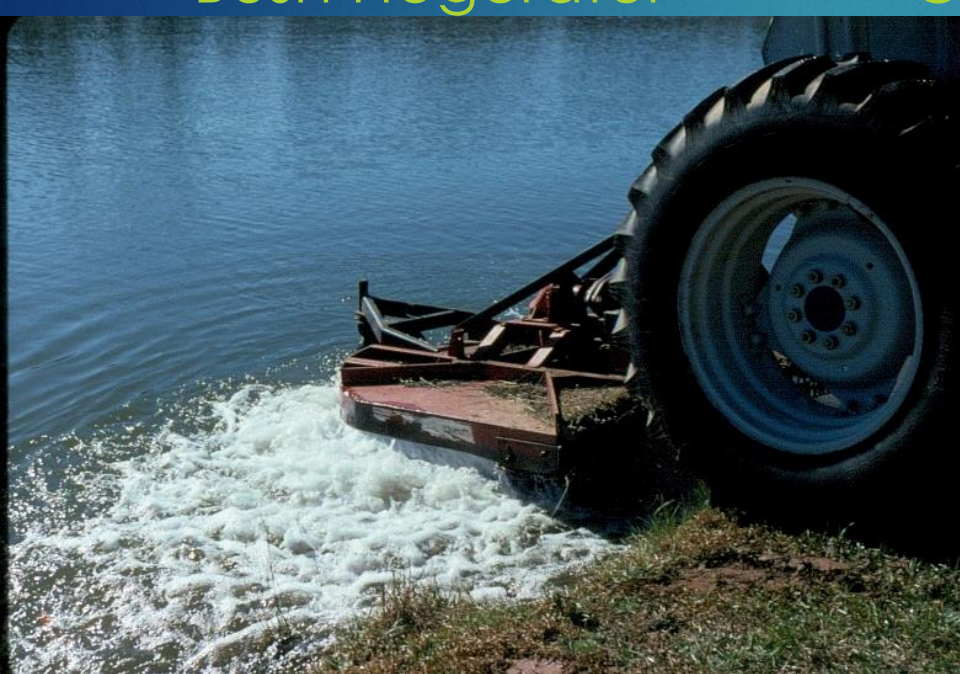
Redneck aeration



In an emergency, any type
of aeration is better than
none

Bush Hogerator

Outboarderator



Fish-kills can happen to anyone



Aeration techniques have advanced







Take fountains out in Winter



Vertical Pump agitators



$\frac{1}{2}$ pound of fish per gallon
of water



Peters yesterday 8,000#
using 2- $\frac{3}{4}$ hp



Chicago a few summers ago



Iron removal



Carbon dioxide removal

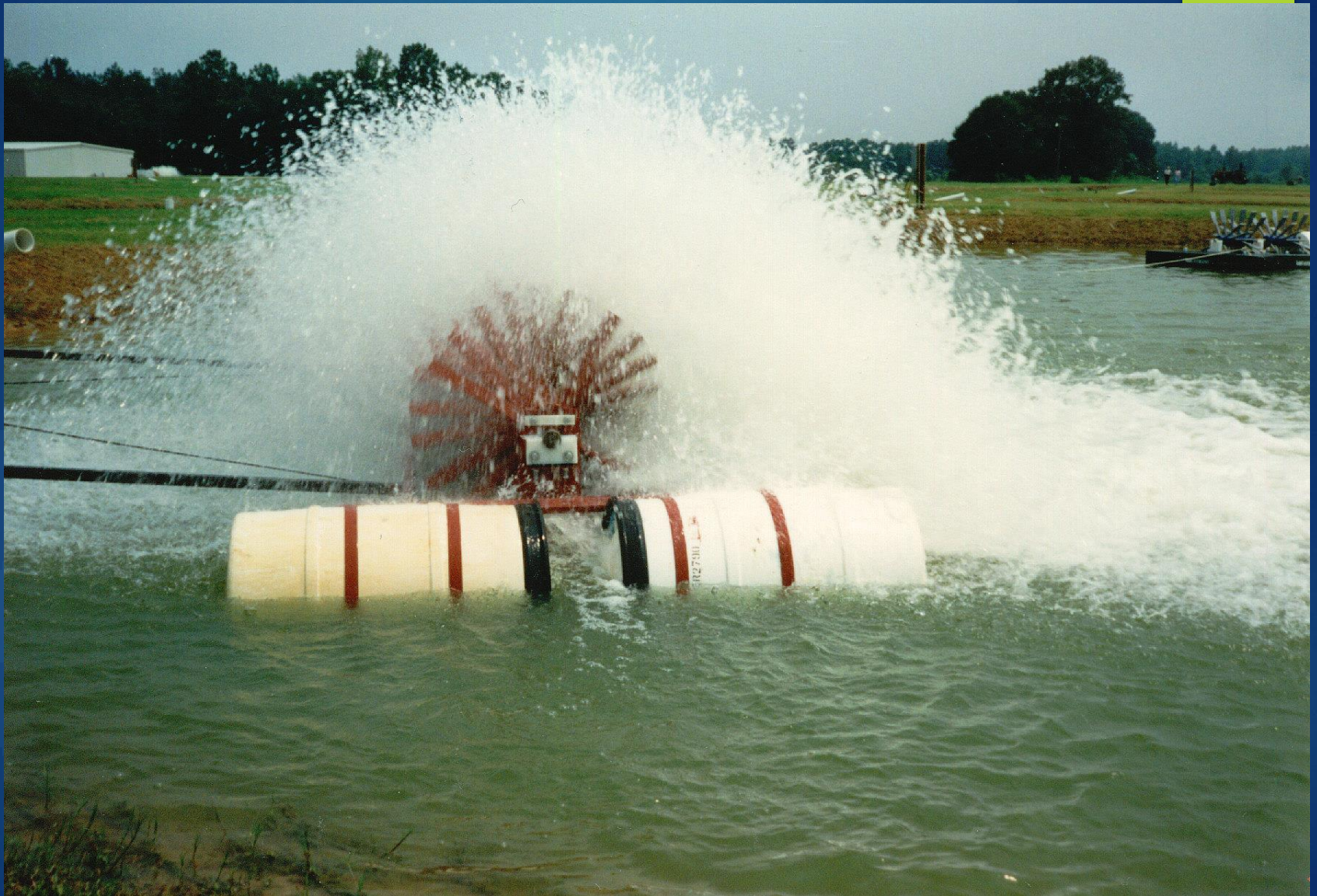












Old School stocking rates/Catfish industry

- ▶ 4,000 pounds/acre
- ▶ 2 hp per surface acre paddlewheels
- ▶ Every 6 ponds one pto driven paddlewheels.
- ▶ 15 acre ponds average

New strategies on some catfish ponds

- ▶ Pond size 3-6 acres
- ▶ Split ponds with 3 rpm circulators
- ▶ 14,000 pound/acre
- ▶ Best feed conversions 1.87:1
- ▶ 8 hp/acre
- ▶ Adds .086 cents to production costs per pound – cost of production .75. selling price \$1.15. average farm size 450 acres
- ▶ \$2.2 million profit every 17 months











Net pen - circulate

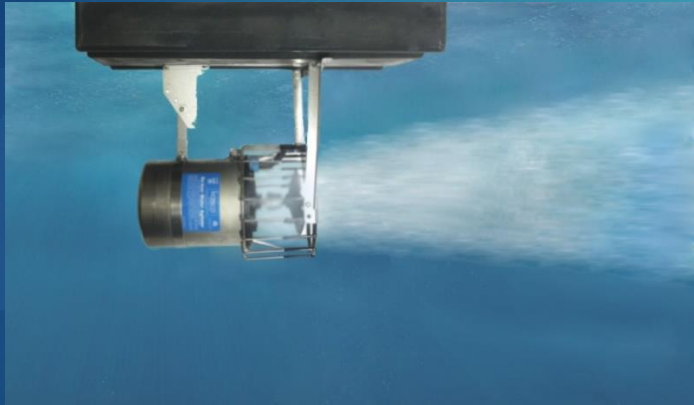


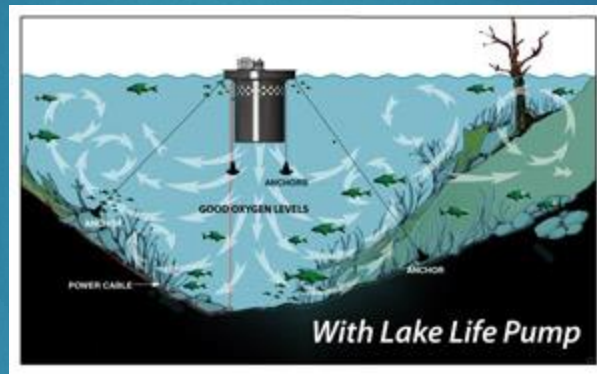
12 Volt





Circulators



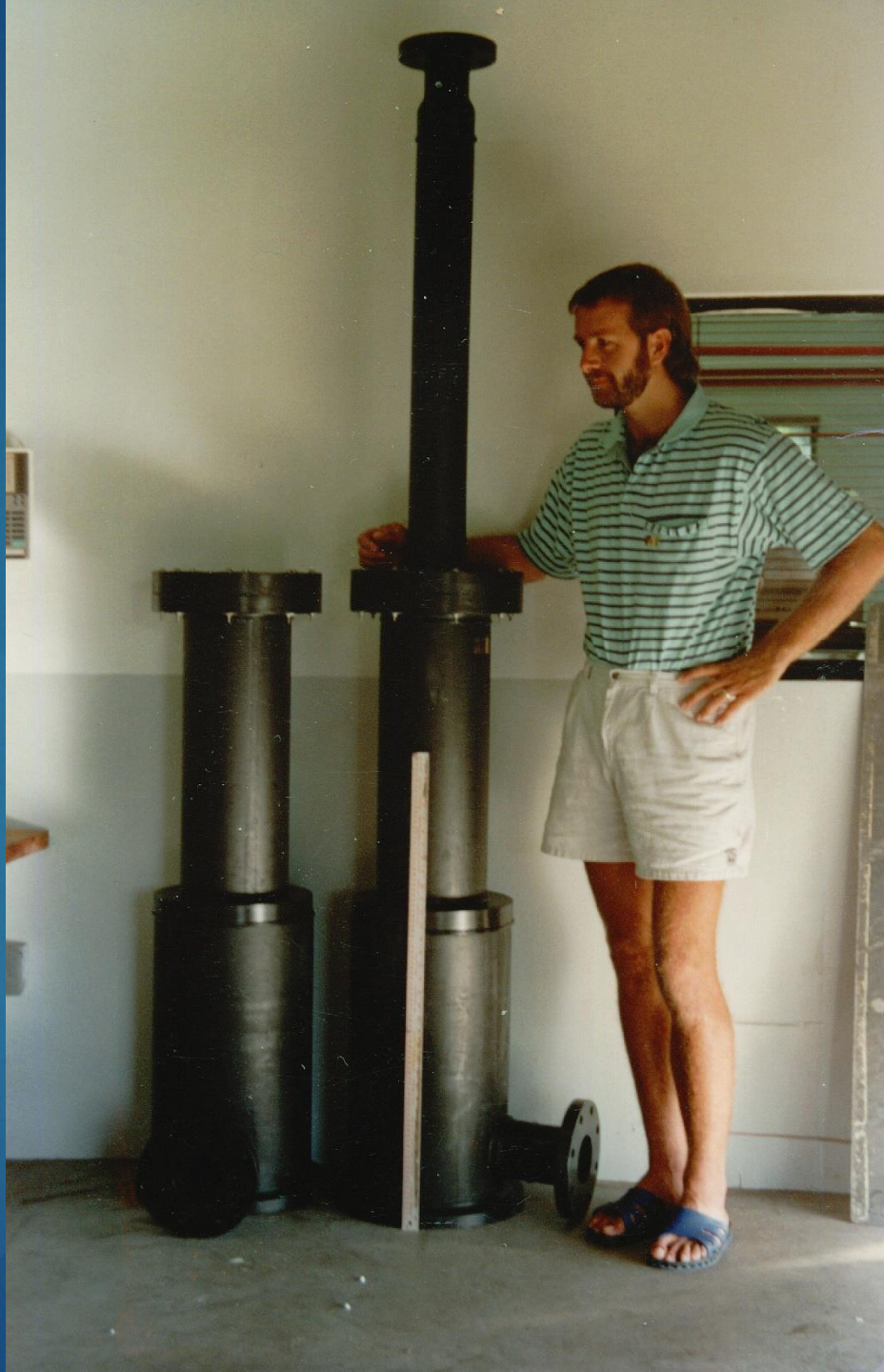












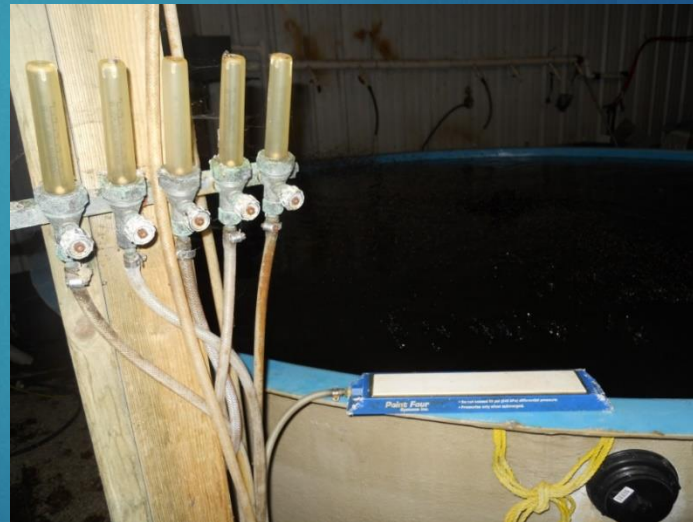


Pure oxygen as a back up

Walleye production -
Iowa



Trout Production -
Alberta





























游水黑魮

TILAPIA

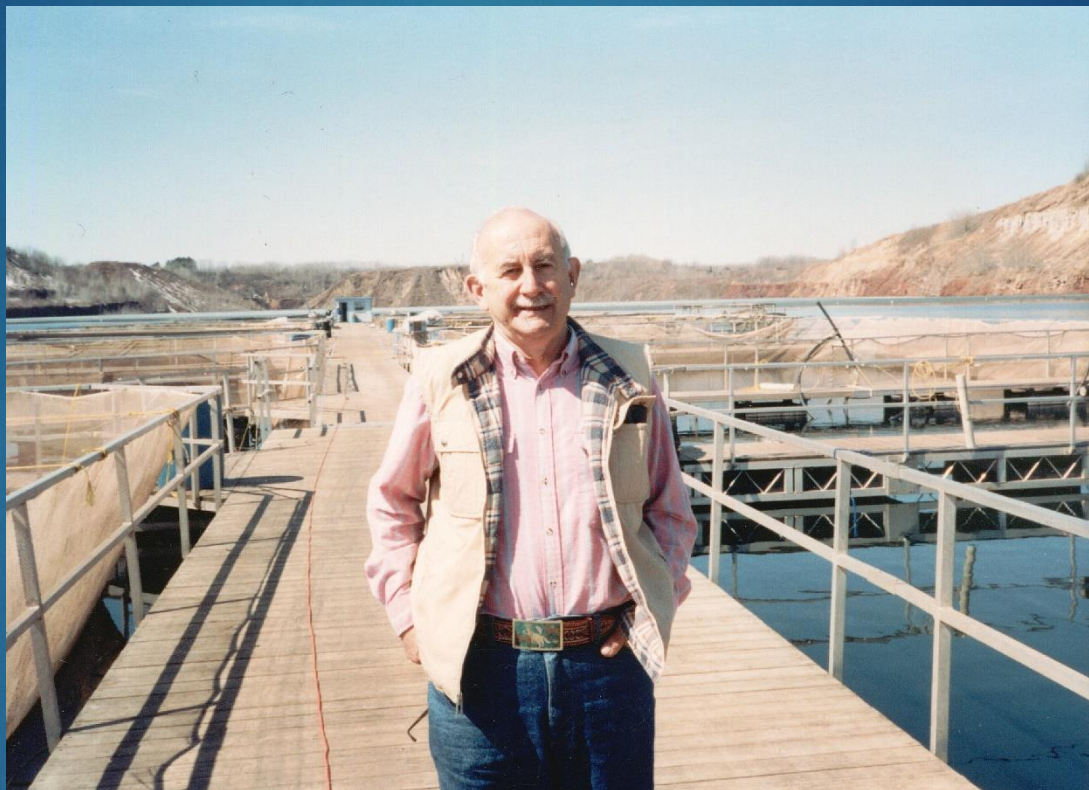
4.99

磅
LB













Promote **CATFISH**
Run over a Chicken!

FORD

SAY NO TO DRUGS
DON'T EAT FARMED FISH


NALEY
CHEVROLET

MPTR POWER
TO VAP

702-LA1
10,000 lakes

BLA



PROTECT PEOPLE  **PROSECUTE PETA**

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Smoke Fish....Not Crack!!!!



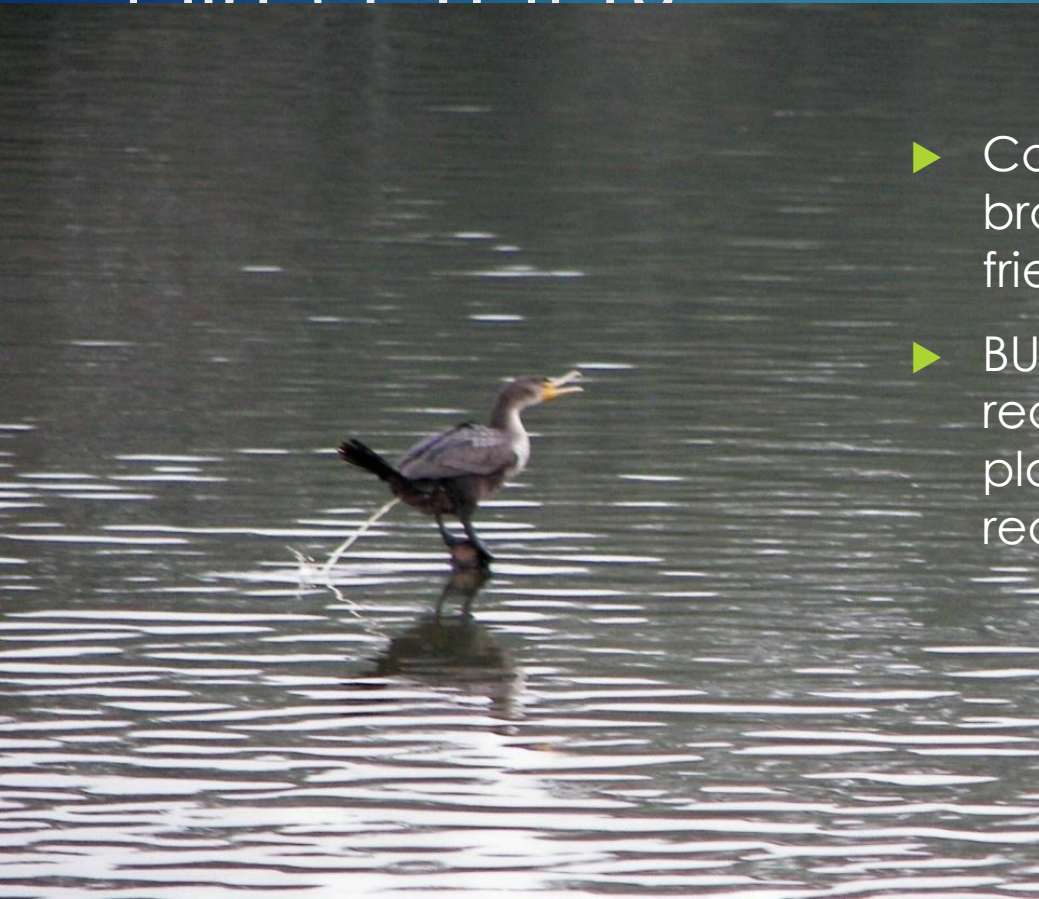




Bird Solution



Aeration helps get rid of bird crap?

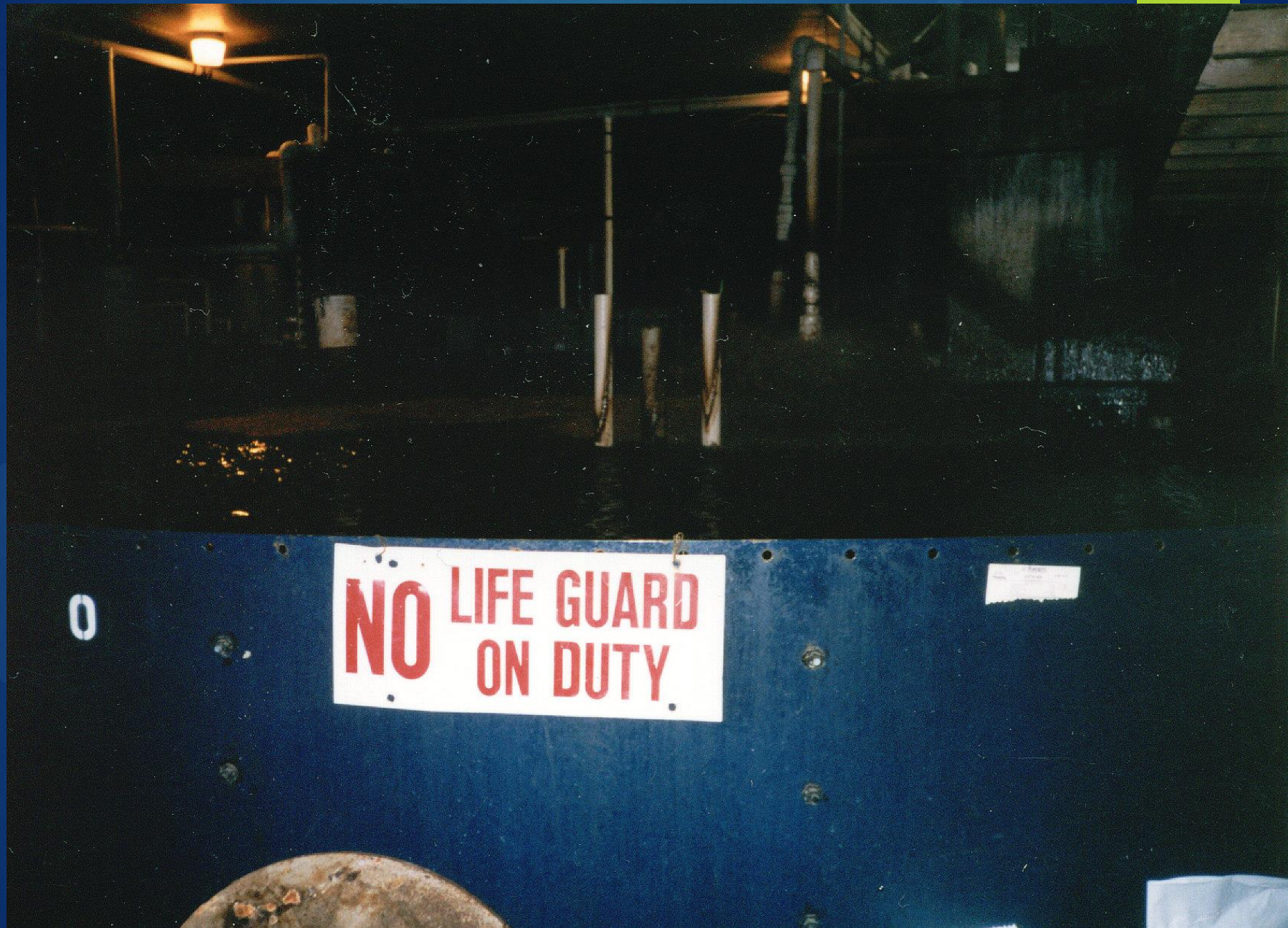


- ▶ Can tie up nutrients brought in by feathered friends
- ▶ BUT it does not always reduce it to a level that plants notice the reduction



















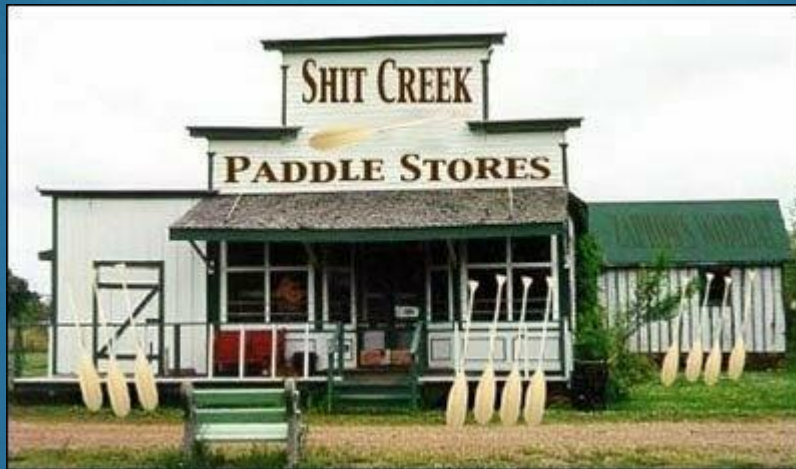
Considerations when purchasing aerators

- Aeration efficiency
- Circulation effectiveness
- Minimal maintenance
- Safety
- Simple
- Correct size for desired results
- Cost – initial, replacement/maintenance and electrical

Make sure they have competent staff



Does the company have
EVERYTHING you need



Lastly!!!

- ▶ With Proper Aeration all of your fish will look like.....

















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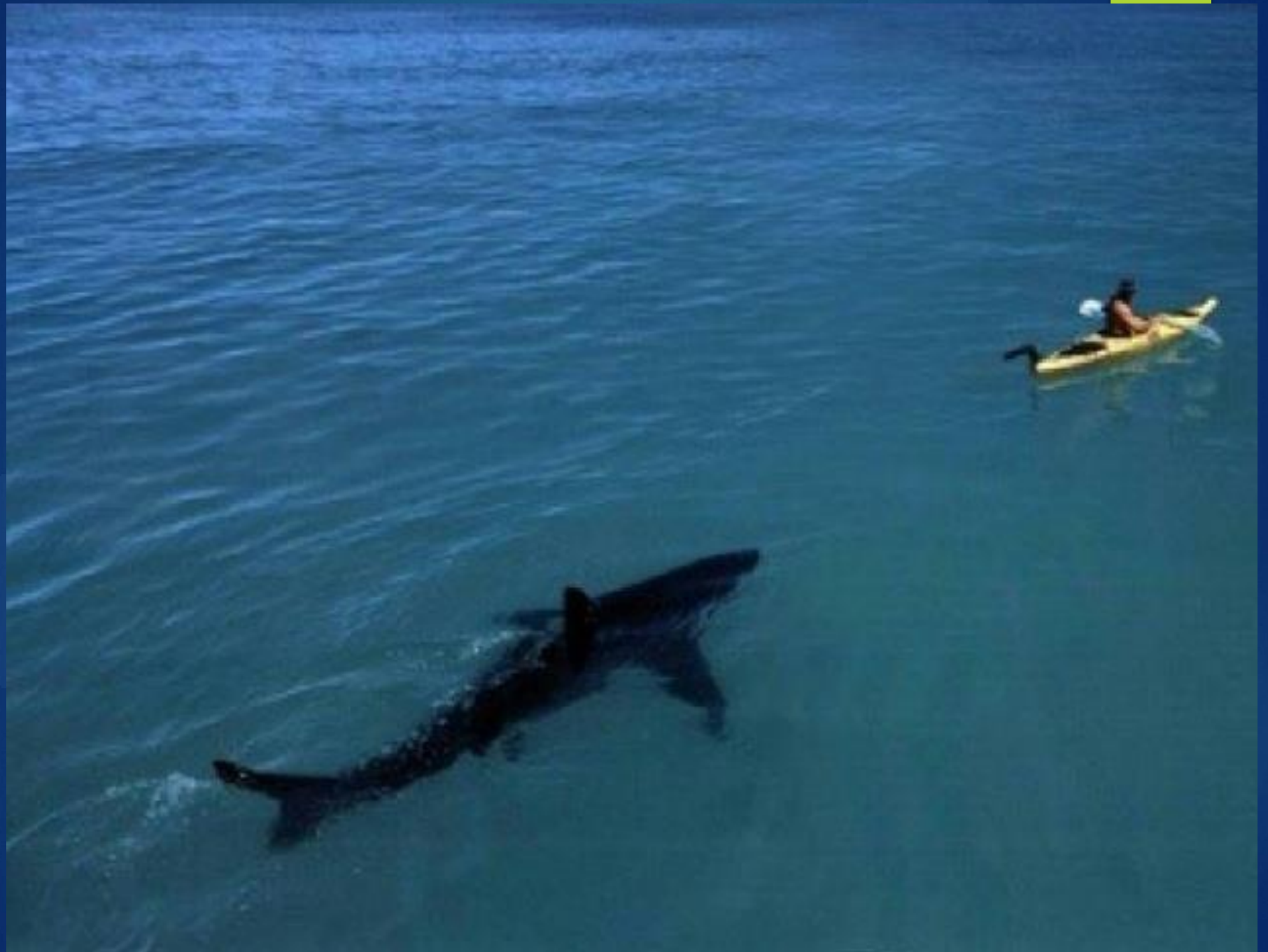


And Without proper aeration...

- ▶ Your Fish will look like.....









PETA goes away



PETA- They were in Tampa and Seattle



Use sun screen



Learn from your elders



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MARINE, INC.

Kasco[®] Aeration



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