

2011 Limnocorral Study at Barr Lake



CLRMA Fall Conference
November 16th, 2011

Problem

Excessive
Nutrients



Symptoms

Low Oxygen

Aesthetics

Chl-a

Algae Blooms

Taste/Odor

High pH

Fish Kills

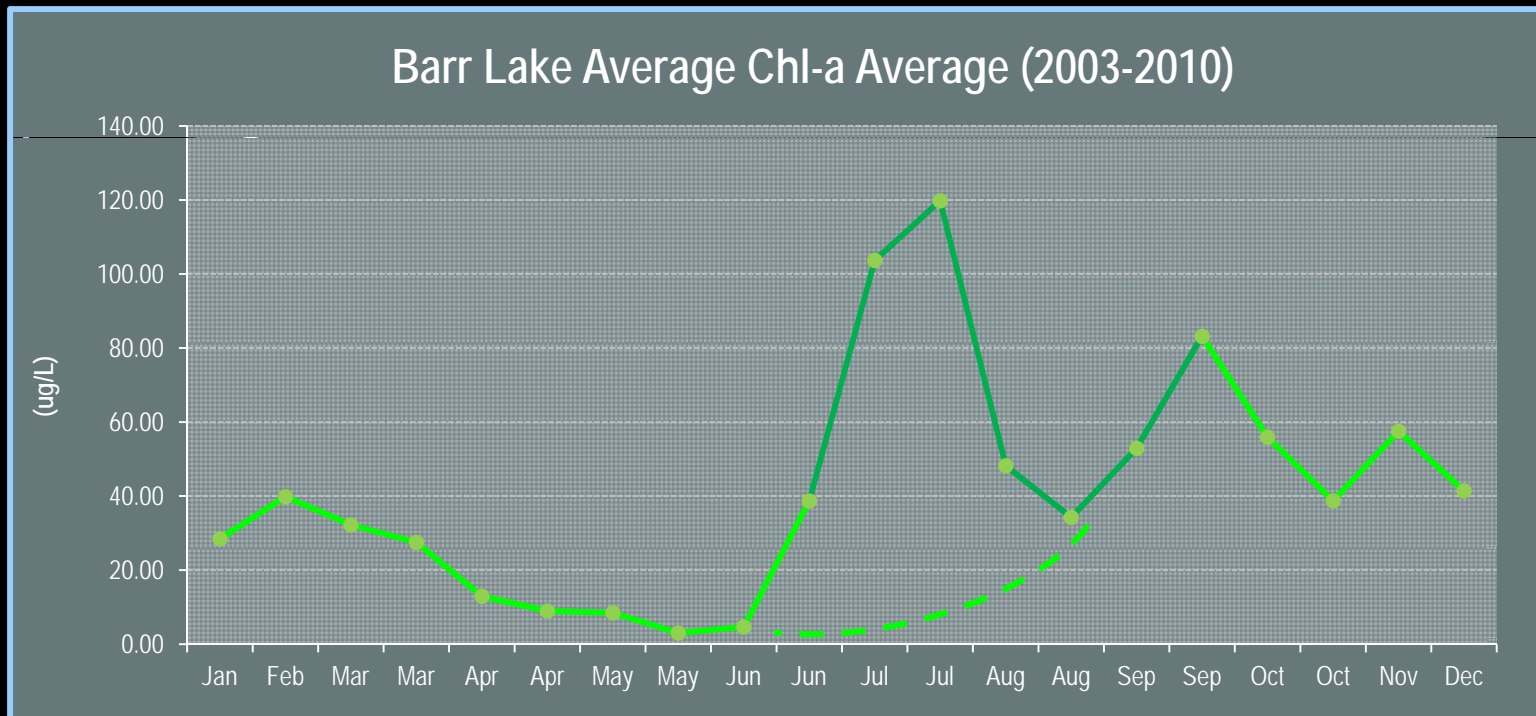
Water Quality Issue

Current Conditions

- Summer TP average 500-600 ug/L
- 85th% pH = 9.3
- Alkalinity = 160 mg/L
- Summer Chl-a average 30-60 ug/L

WQ Goals

- Summer TP average 40-60 ug/L (TP max <100 ug/L)
- 85th% pH <9.0
- Alkalinity <100 mg/L
- Summer Chl-a =25 ug/L



Purpose of the Study

Corrals

18,000 gallons each

10 meters deep

3 meters across

Water tight

\$1,800/each



Aluminum Sulfate

About 1-2 gallons per corral

Permit required

No alum used in 2011

Alum not covered by Pesticide Permit



Aeration System

1/2 hp air compressor

600 feet of weighted air line

3 porous rock diffusers



Monitoring

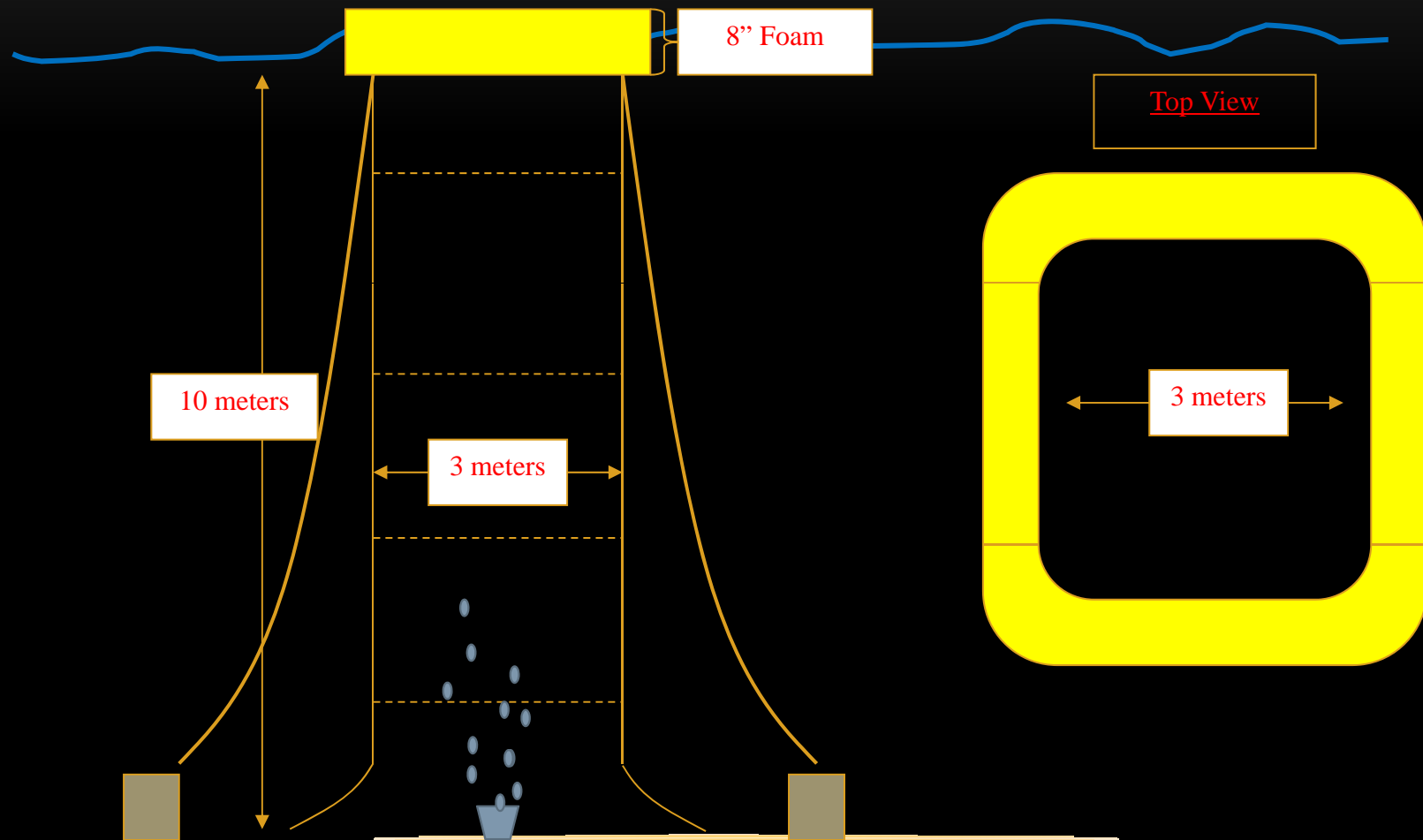
Bi-weekly (May – September)

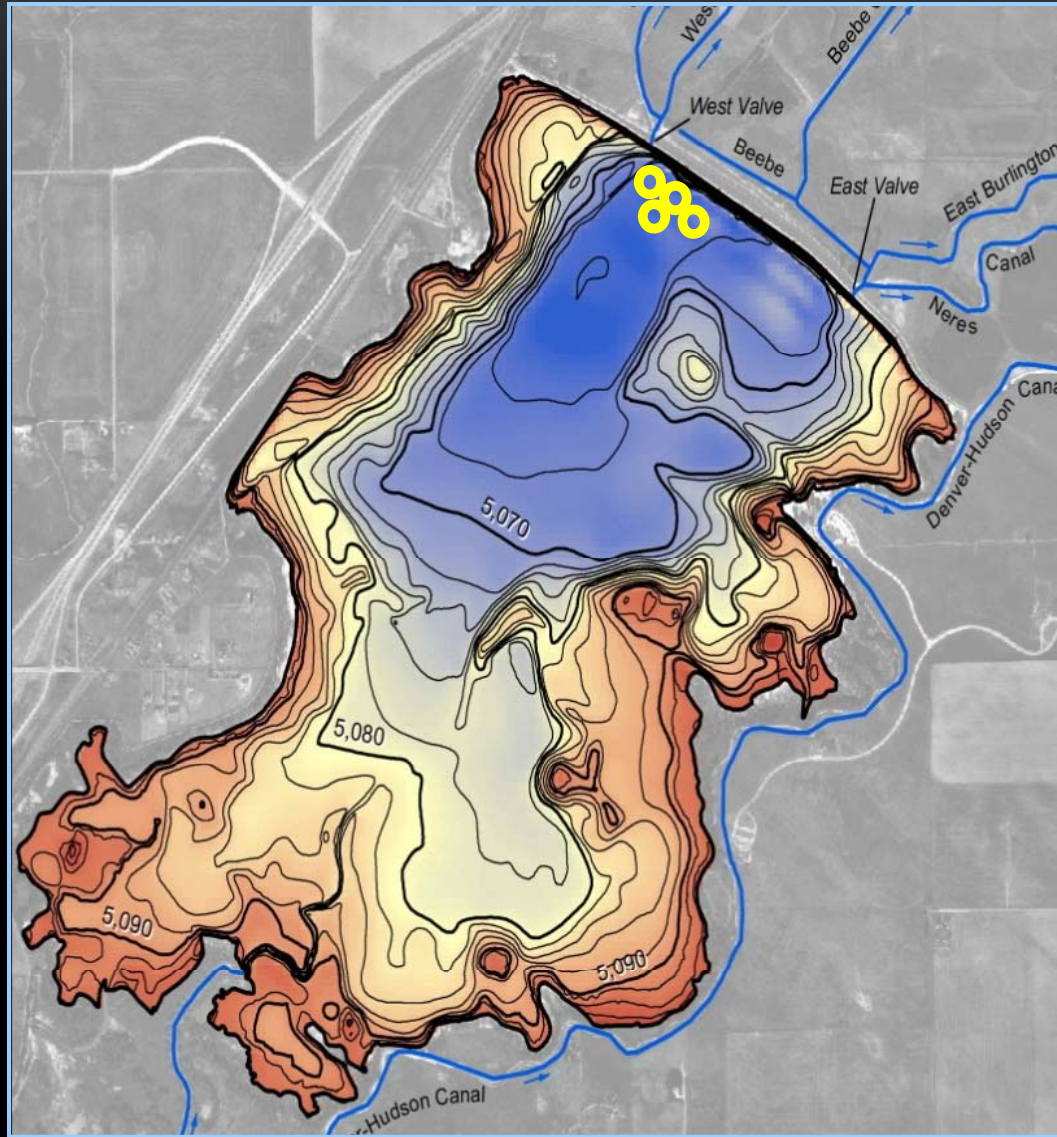
Profiles

P, N, Chl-a, and ALK

Limnocorrals

Reservoir Management





Location

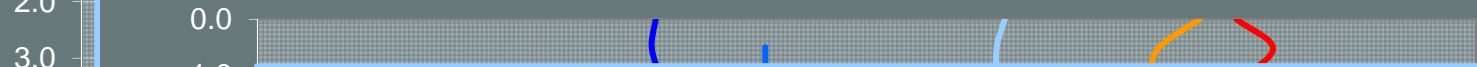


Control vs Aeration

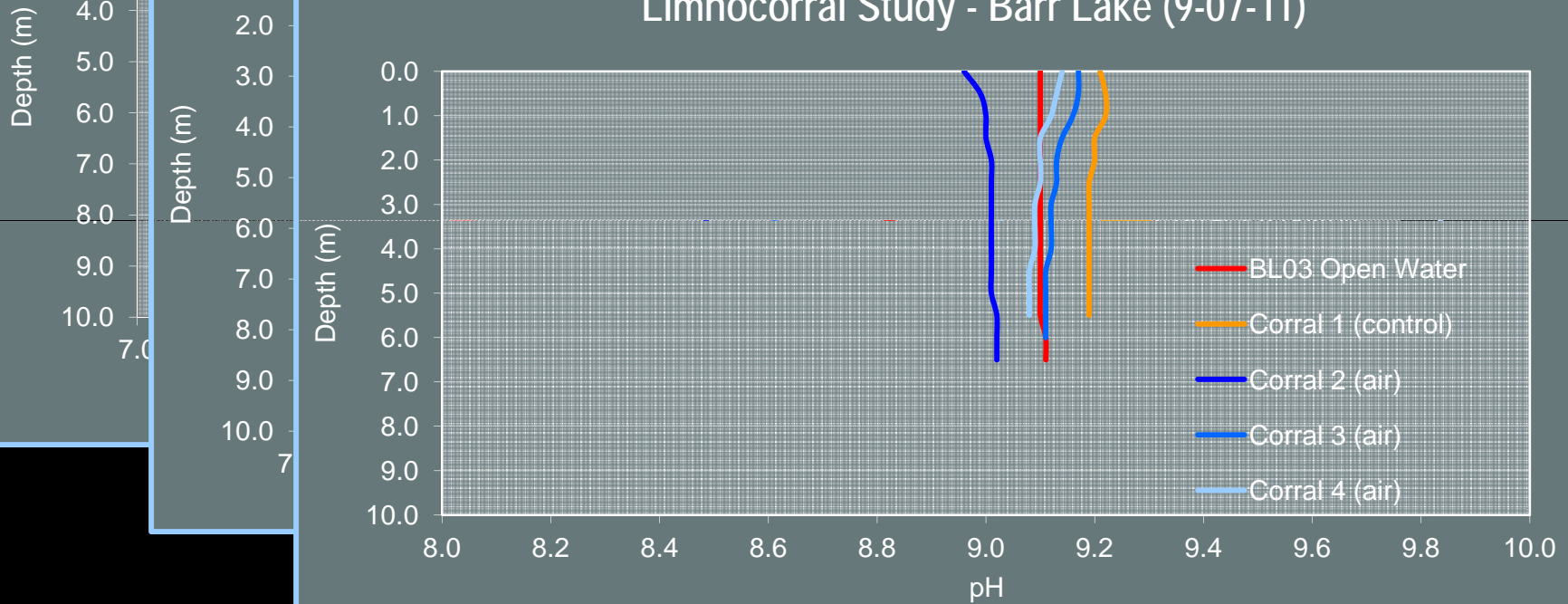
Limnocorral Study - Barr Lake (7-05-11)



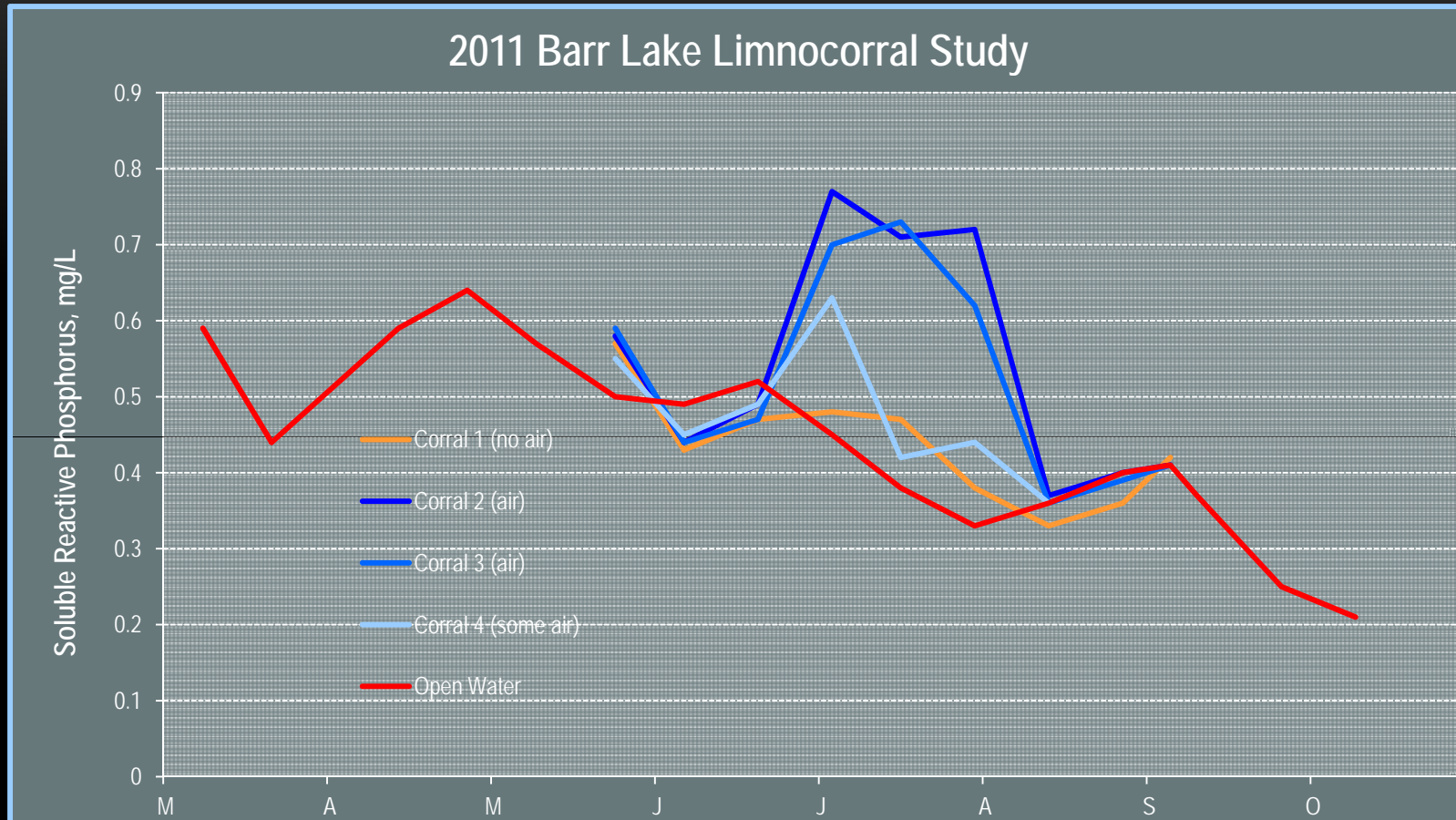
Limnocorral Study - Barr Lake (8-01-11)



Limnocorral Study - Barr Lake (9-07-11)

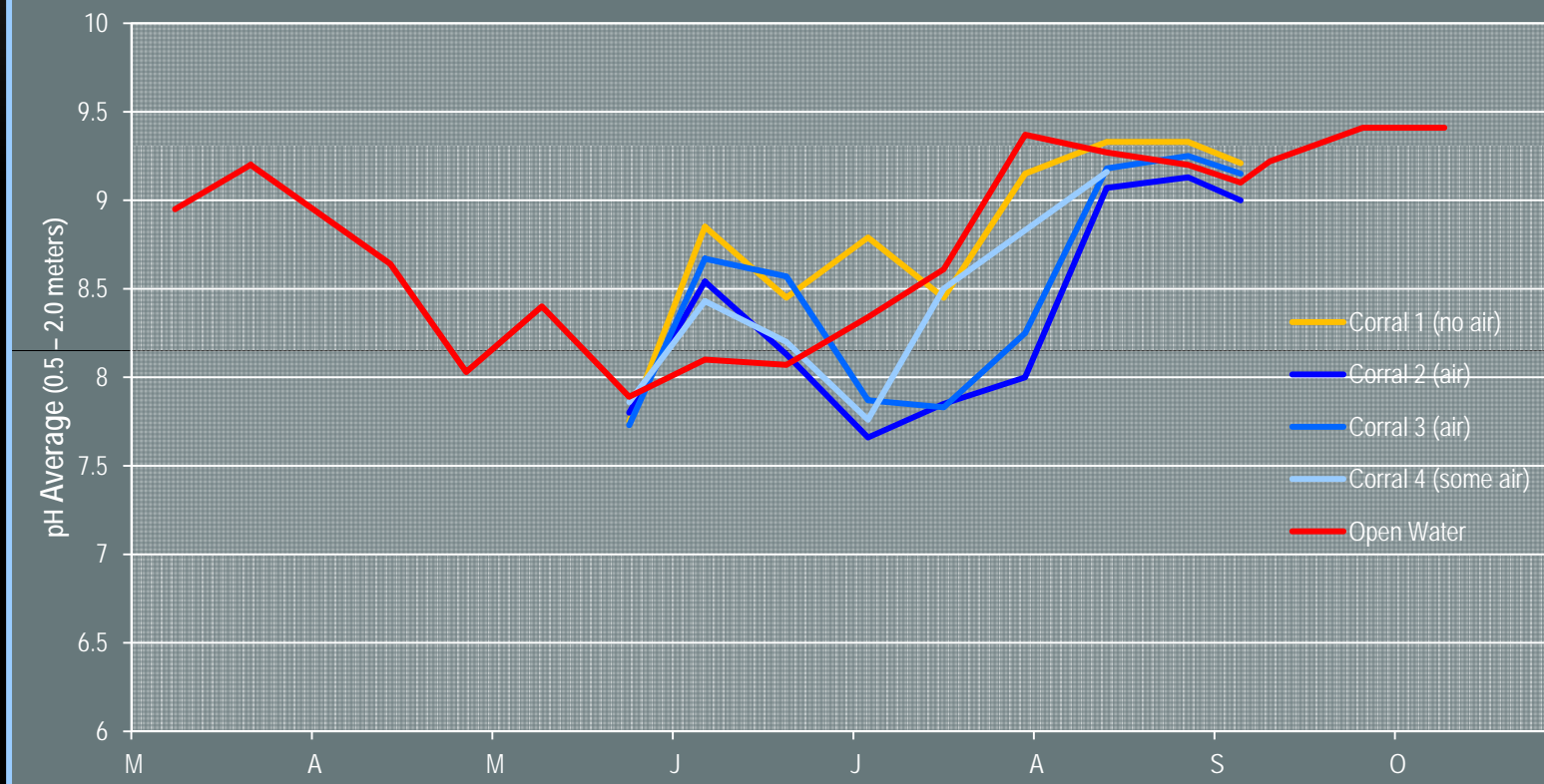


Profile Data

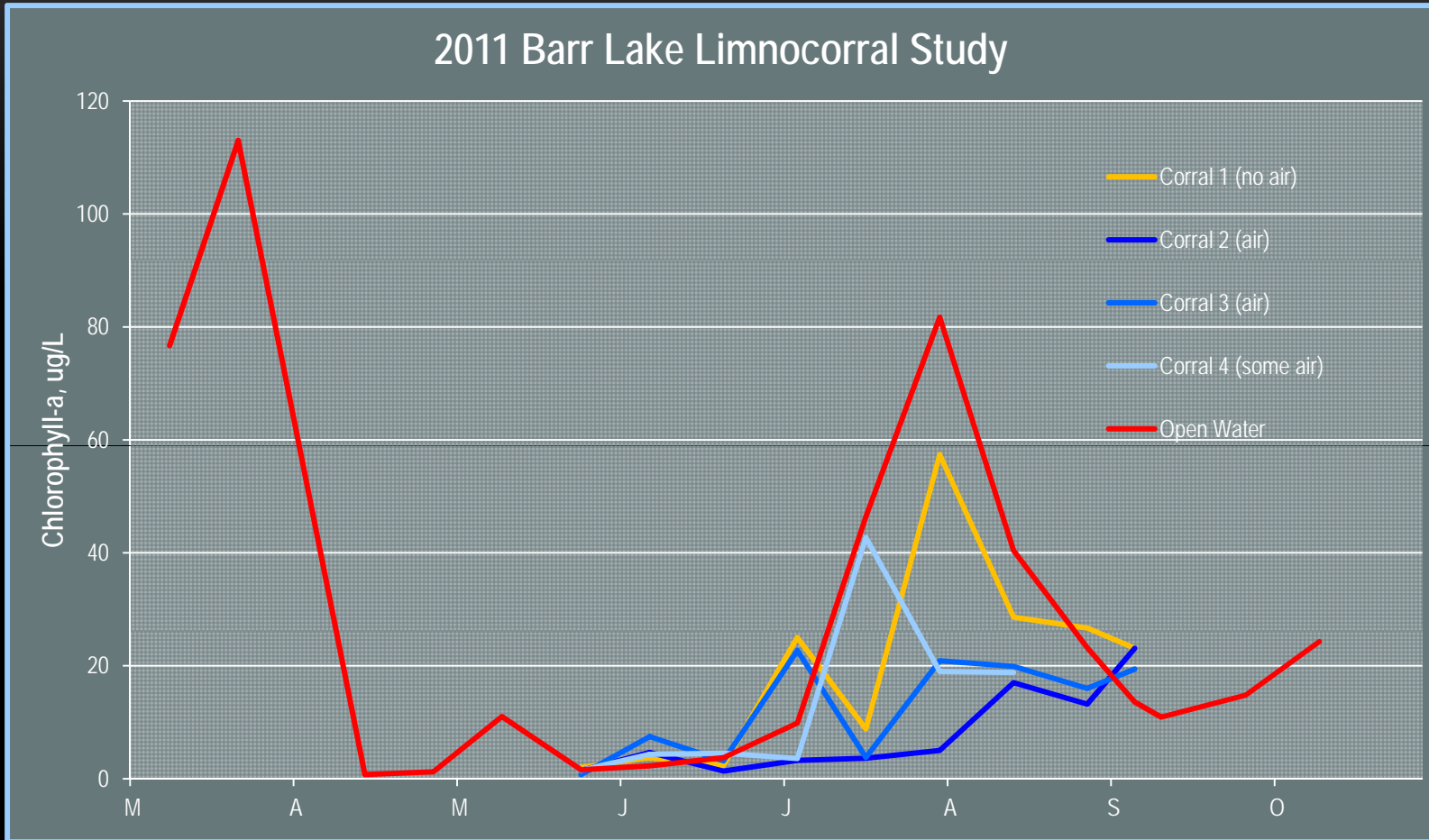


Phosphorus Data

2011 Barr Lake Limnocorral Study



pH Data



Chlorophyll-a Data

Location	Date	Species	Units/ml	Volume	Abundance	Volume	Group
Barr Lake	8/24/2011	Aphanizomenon	8,225	1,410,000	99%	96%	blue green
(Open Water)		Microcystis	123	3,840,000	1%	4%	blue green
		Total	8,348		100%	100%	

Barr Lake	8/24/2011	Aphanizomenon	641	1,100,000	92%	93%	blue green
(Corral 3)		Cryptophytes	27	13,116	4%	0%	Cryptophyte
		Microcystis	28	217,000	4%	6%	blue green
		Melosira	1	31,589	0%	1%	Diatom
		Total	697		100%	100%	

Phytoplankton

Do's & Don't's

- Do anchor really well
- Do replicates and a control
- Do find a better approval process for alum

- Don't leave in for 5 months
- Don't put near dam outlet
- Don't forget the burritos



Lessons Learned