Water Quality in Ponds

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What is the major provider of life in most ponds? Not aerators and not you....
Plankton!

- **Phytoplankton** provides the bulk of the oxygen throughout the day
- Aeration should be used to supplement plankton production
- Don’t run your aerator 24/7 unless necessary! Increases costs substantially
- As mentioned earlier… parameters are often intertwined so measure them frequently!

![Image of water treatment facility]

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COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES
How to Recognize Low DO

- Fish will “pipe” at the top of the water; why?
  - Often will dive when you approach
- Bigger fish will die sooner than small fish; why?
- In a pond with multiple species, all fish are likely to suffer
- Low DO can often be predicted and limited/eliminated
  - Keep good records!
- The cause of low DO → Everything under the sun
  - Extended periods of cloudy days; why?
  - Organic matter decomposing; why?
  - Hot &/or stormy weather; why?
  - Lots of aquatic plants
Limiting Low DO

- Test your DO concentration daily
  - more if needed
- Keep your eye on the weather
- Be ready for during storms
  - Pond turnovers and power outages
- Feed appropriately
- Be careful with herbicides
- Prevent too many aquatic weeds
- Have aerators in place and use them
  - Bottom bubblers in this region common
Pond Dyes

- Learning many ponds are fertile enough here
  - Many people use pond dye to limit excess nutrients (plankton growth)
- Blue dye is by far the most common
- Most of your pond stocking companies will sell it
- Adds great color to ponds that want to be very aesthetically pleasing
Other parameters that may need to be measured

- DO (early!)
- pH
- Temp
- Total ammonia-nitrogen
- Nitrite
- Secchi
- Chloride
- Alkalinity
- Carbon dioxide
- Hardness
- Iron
- Hydrogen sulfide

If you read something in milligrams per liter (mg/L) or in parts per million (ppm) that means the same thing!
How often?

You need to answer some questions first…

• Are you just doing this part time as part of a retirement?
• Is this a hobby?
• What kind of density do you have in your ponds?
• Can you risk losing the entire pond?
• How much capital do you have available?
How often?

If you’re running this as a business there needs to be dedication.

<table>
<thead>
<tr>
<th>Daily</th>
<th>Bi-weekly</th>
<th>Bi-Monthly</th>
<th>Monthly</th>
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<tbody>
<tr>
<td>Temp</td>
<td>pH</td>
<td>pH</td>
<td>Alkalinity</td>
</tr>
<tr>
<td>Dissolved Oxygen</td>
<td>TAN</td>
<td>TAN</td>
<td>Hardness</td>
</tr>
<tr>
<td></td>
<td>Nitrite</td>
<td>Secchi</td>
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</tbody>
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There are exceptions to everything. Secchi may not play a role if a pond is heavily dyed & TAN and nitrite may need to be checked daily when levels are high.
Why secchi, alkalinity, and hardness?

These tend to change more slowly in pond settings.

- Secchi – Determines how clear the water is in a pond
- Alkalinity – ***Necessary for proper pH buffer***
- Hardness – A measure of magnesium and calcium concentrations
  - Necessary for fertilizer rates
Low alkalinity?

Appears to be less common around here but just in case…

- Ounce of prevention is worth more than a pound of the cure
- Get your soil tested prior to filling or test water for alkalinity
- If low you can add Ag-Lime; not slaked, quick, or hydrated lime
- Not always a “cure all” but will likely help with strong pH swings
Kits, meters, strips

Today we will learn how to calibrate a YSI DO meter and properly use the HACH FF-1A test kit.

• These are **not** cheap items. However, your livelihood is always an investment.

• If aquaculture is your main source of income then a high quality test kit and DO meter is imperative to your success.

• If your business is still in the small-scale beginning stage (hobby) then cheaper kits will likely work until you begin to feel more comfortable with water quality.
Have a fish kill?

While bacteria, viruses, and parasites are a very real threat, most fish mortalities in aquaculture are due to poor water quality!

- Keep up with your records so that you can foresee troubles and prevent them from happening!
- If you aerate, test your parameters often, and keep good records then don’t be too afraid of water quality problems!
- You’re pond will let you know when it’s had enough!
Questions?
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