



# **Best Management Practices for Aquaculture**

---

Joseph E. Morris

Iowa State University

# BMP Definition

---

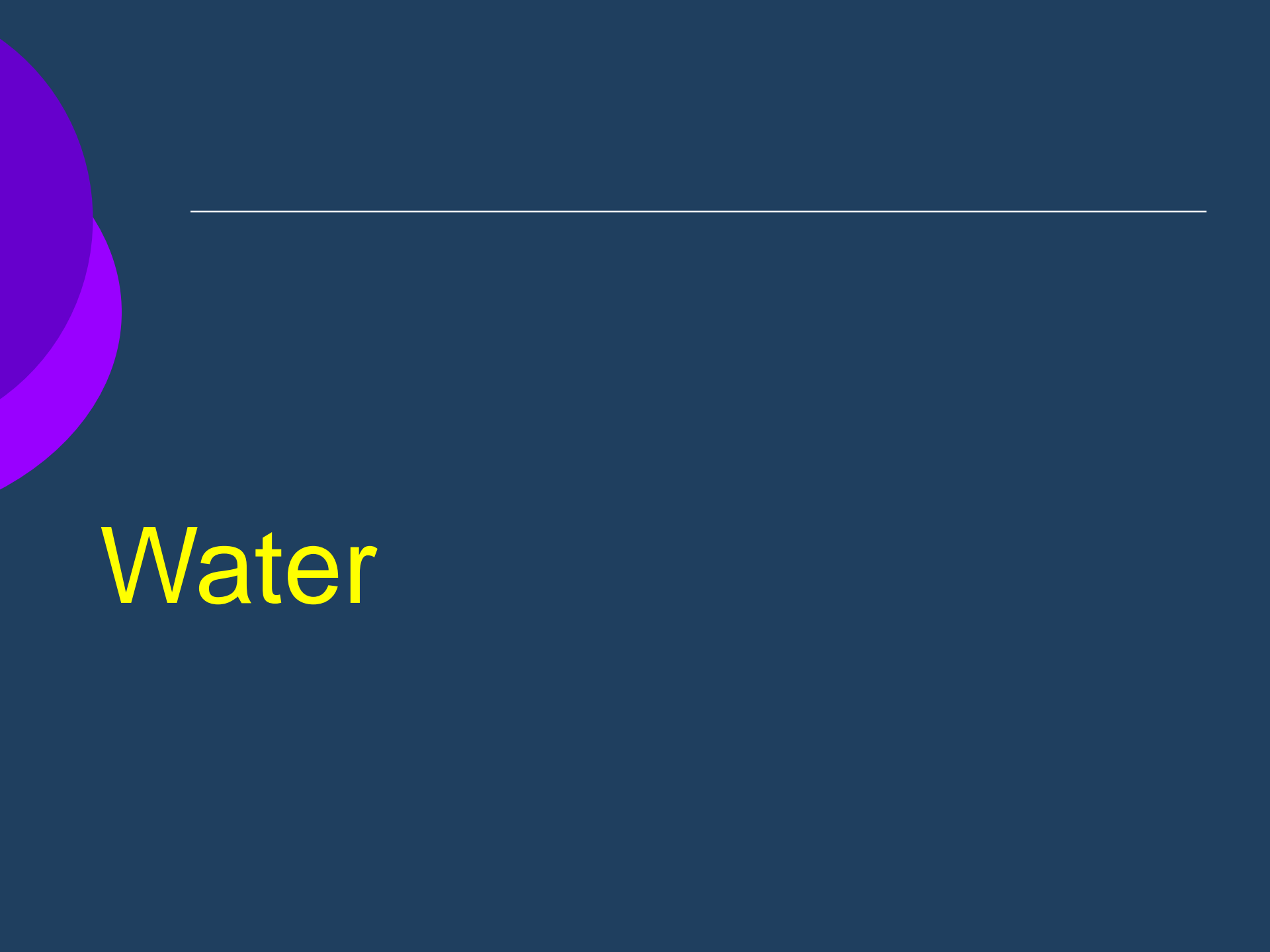
## **B**est **M**anagement **P**ractice

- Any program, procedural technique, method-of-operations, skills, measurement or device that maximizes health and well-being of cultured species, minimizes environmental effects, and promotes an efficient and economic aquaculture operation.

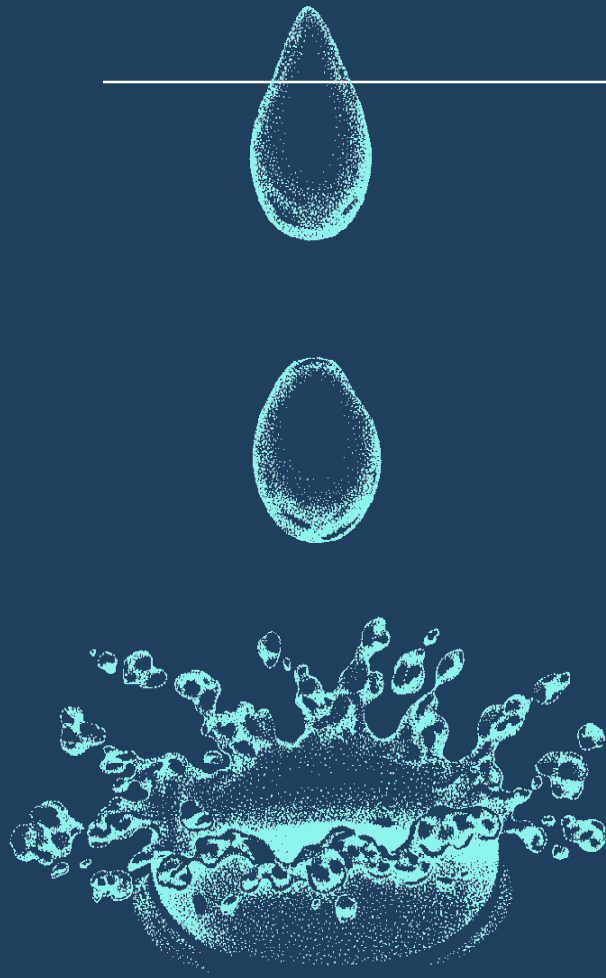
# BMPs for Aquaculture

---

- Water
- Fish health
- Species selection
- Systems
  - Ponds
  - Recirculating
  - Cages
  - Raceways
- Feed management
- Markets



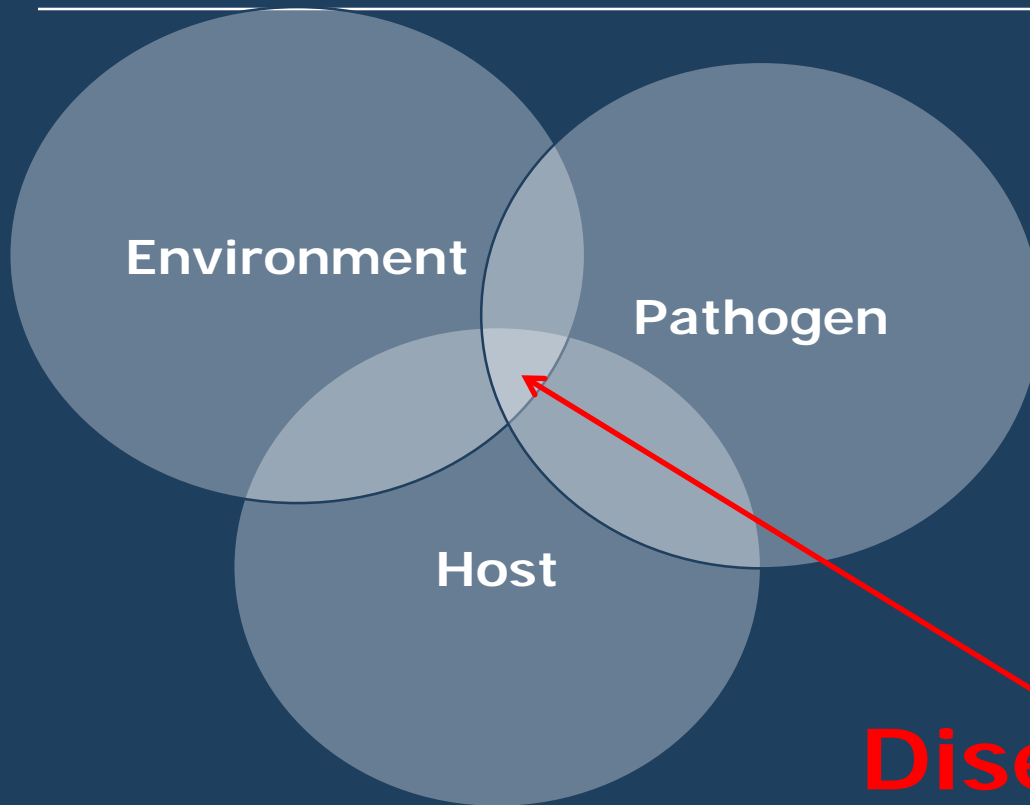
Water



To a great extent  
water quality  
determines the  
success or failure of  
a fish farming  
operation

# Fish Health

---



**Disease Occurs**



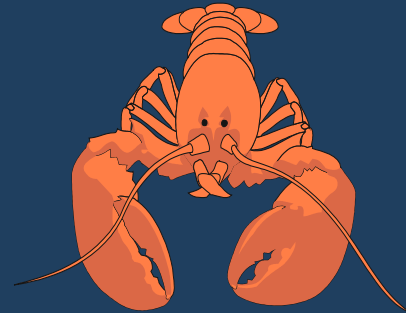
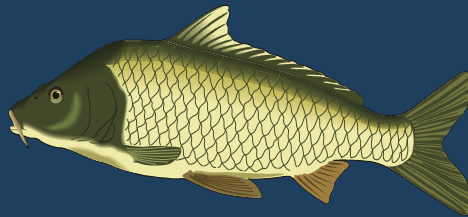
# Species Selection

---

# Selecting A Species

---

- Choose species with production information available.





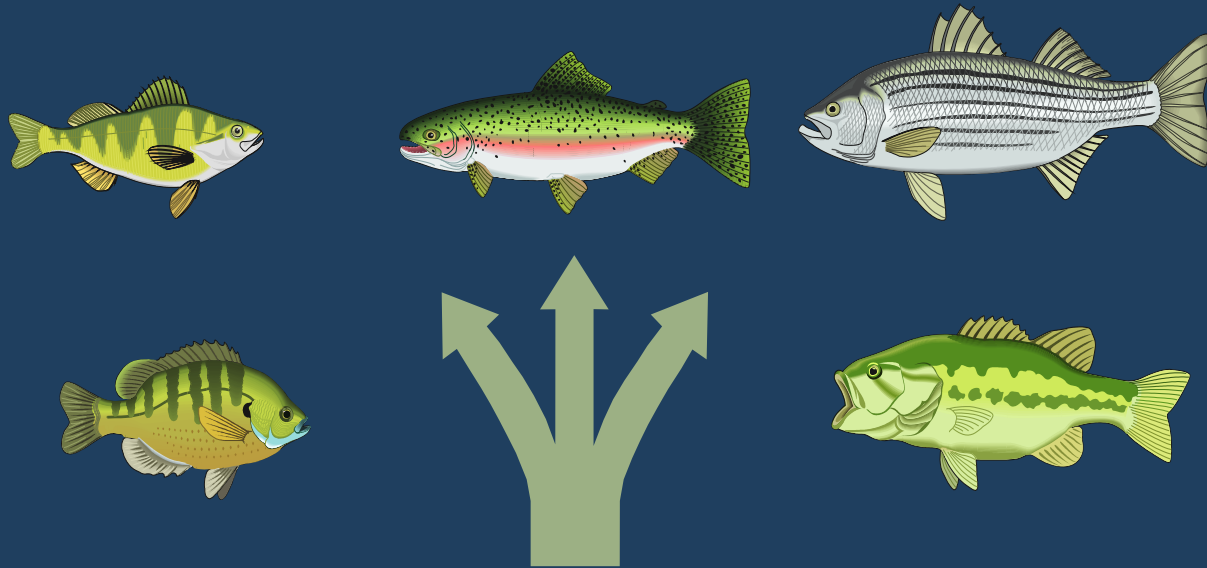
# Species Selection

---



# Selection

---



**If possible, provide variety**

# Ideal Culture Taxa Characteristics

---

- Available stock
- Grow rapidly to larger size
- Reach market size before reaching sexual maturity
- Readily accept a formulated diet
- Feed fairly low on the food chain
- Not cannibalistic
- Show uniform growth in size
- Readily reproduce

# Ideal Culture Taxa Characteristics

---

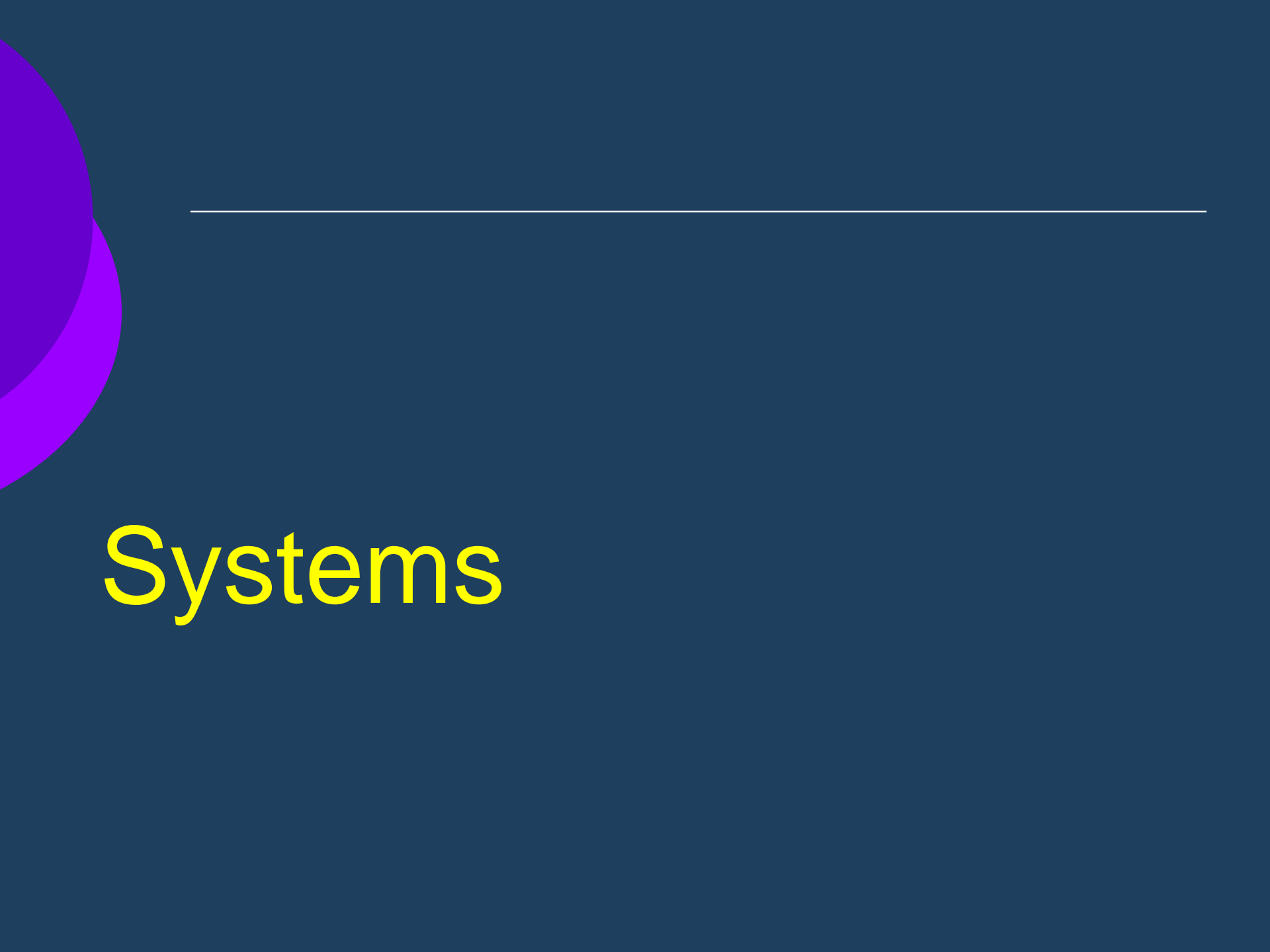
- Produce large numbers of offspring
- Fairly disease resistant
- Handles well
- Produce offspring large enough to accept pelleted feeds at first feeding
- Easily cultured under high rearing densities
- Tolerant of poor water quality

# Ideal Culture Taxa Characteristics

---

- Market value that exceeds production costs





# Systems

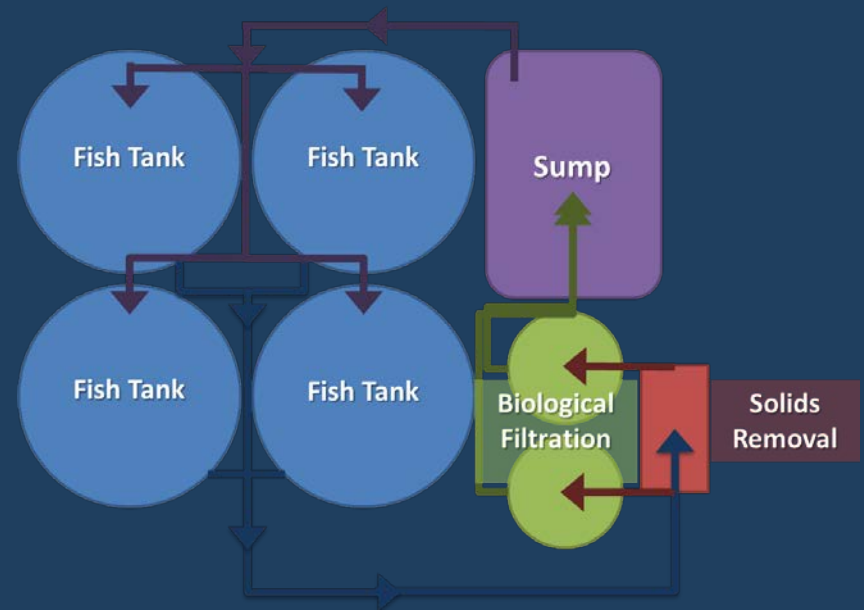
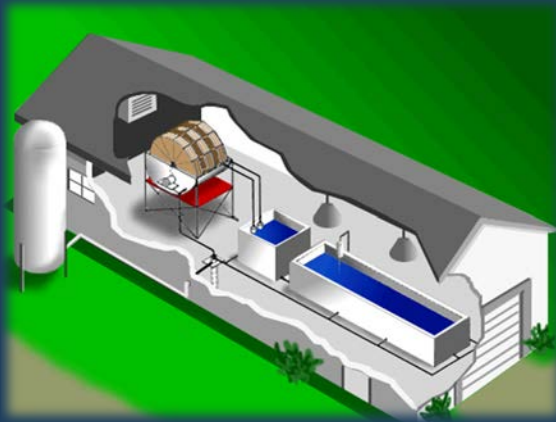
# Levee pond construction

---

- Levee width
  - 20 ft for main
  - 16 ft for others
- Depth
  - 8 ft for overwinter
- All-weather access



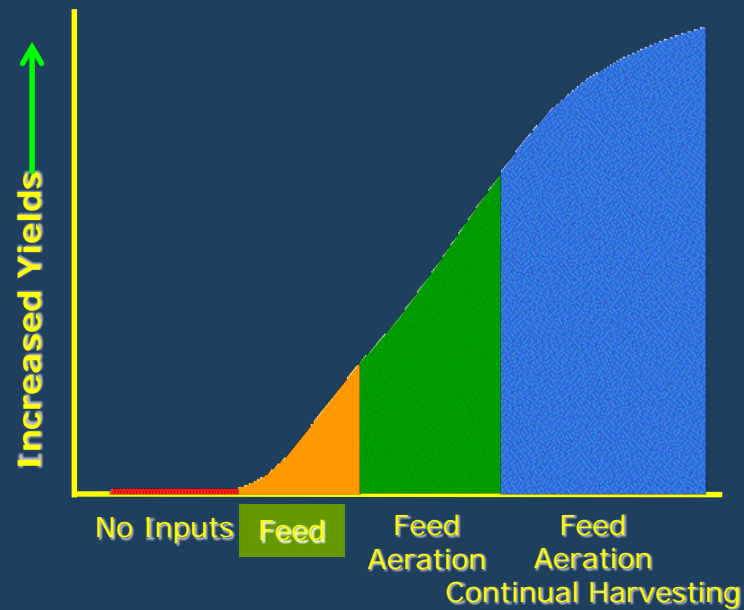
# Recirculating Aquaculture Systems



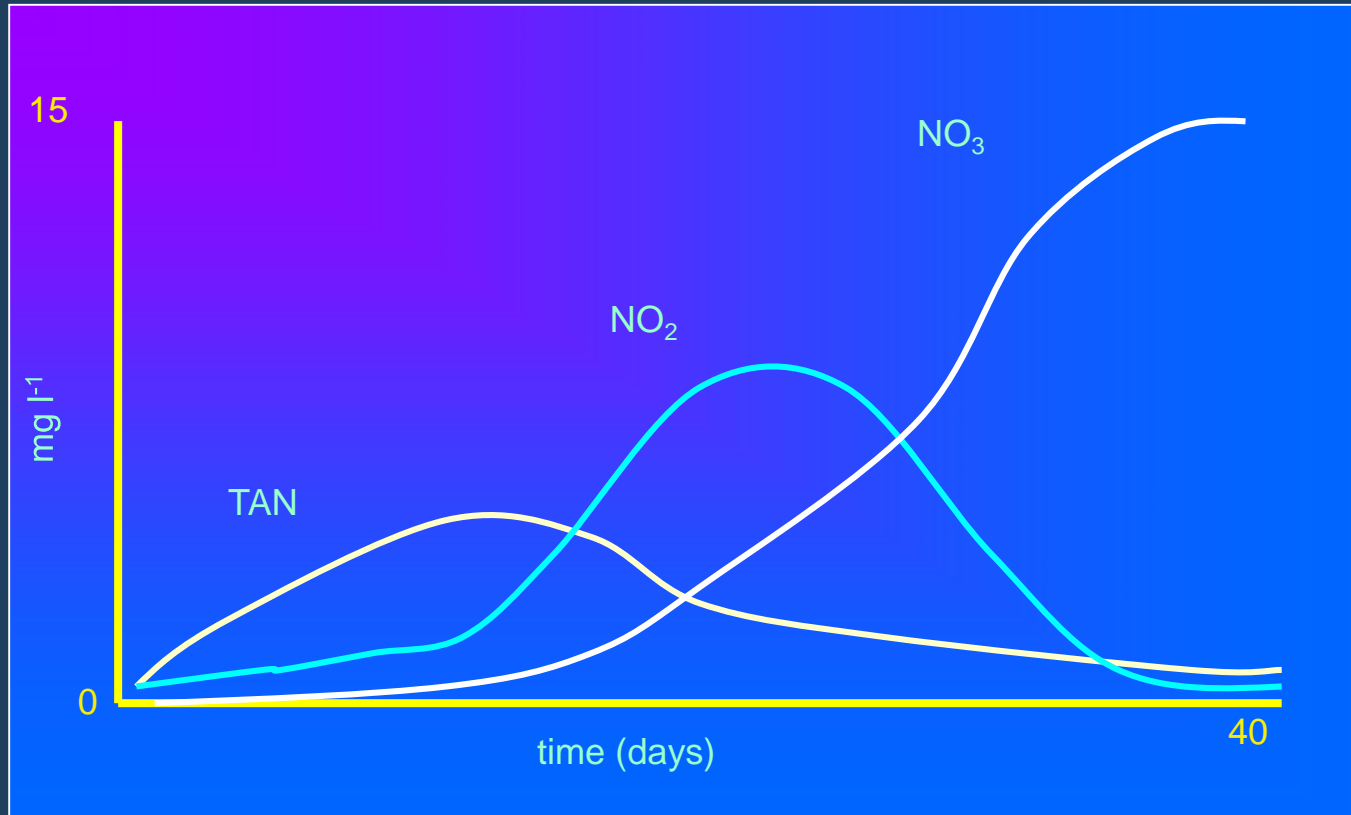


# Production Rates

- Variables
  - Feed
  - Aeration
  - Stocking rate



# Biofilter Timeline



Don't Be Impressed by Fish at High Densities.



Fish can be held at high density with low feeding rates even in a poorly designed system.

# Instead

---

- Be impressed by how much feed can be used without harming water quality.
- Remember it takes feed to grow fish.

The slide features a dark blue background. In the top-left corner, there are two overlapping purple circles of different sizes. A thin white horizontal line spans across the upper portion of the slide, starting from the left edge and extending towards the right.

# Feed Management

# Feeding Regime

---

- Continuum from extensive to intensive
  - Live feed
  - Supplemental stimulation of food web
  - Formulated diets, supplemental vs. complete



# Feeding

---

- Pellet size – Feed the smallest fish
- Frequency – Decreases as animals get older
  - Larvae – constant supply of food
- Consistent
- Avoid excess food
  - Cost money
  - Expensive fertilizer
- Ad libitum, satiation or restricted feeding?

# Storage

---

- Cool, dry
- Formulations affect storage – fish meal and oil
- Nutrient losses – fatty acids, vitamins
- Contamination – rodents, fungal, bacterial





---

# Questions ?