

# Water temperature and pH monitoring in a floating IPRS unit in Piqua, OH.

## Supplemental Water Quality Data

### 2025 ePLUS Report

#### Objective:

Water quality variables such as temperature, dissolved oxygen, pH, ammonia, nitrites, nitrates, etc. are key in aquaculture production. This study evidences the effect of water temperature on feed consumption and fish growth.

#### Study Design:

Largemouth bass stocked in a floating in-pond raceway system (IPRS) in a reclaimed limestone quarry (17 acres in size, 22.5 ft deep) in Miami County was cultured during 487-days. During the production cycle water temperature and pH was monitored using automatic data loggers with parameters taken every hour.

#### Observations:

Figure 1 – Water temperature (°C) in the floating in-Pond Raceway System (IPRS)

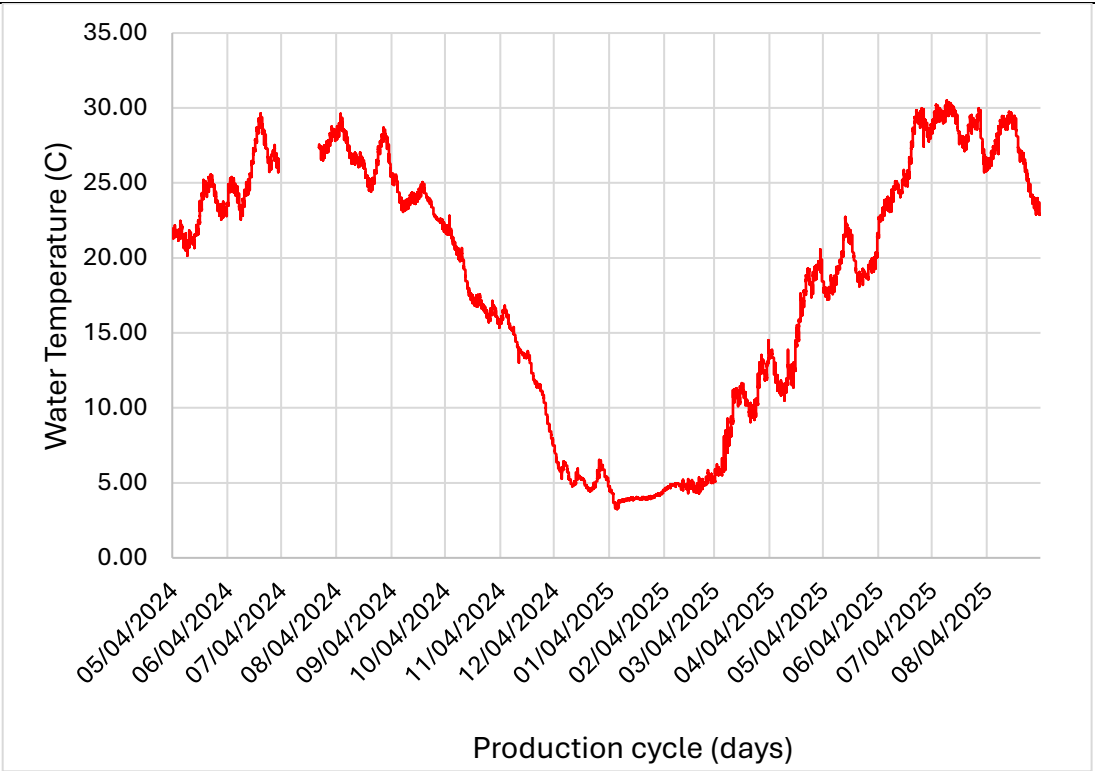


Figure 2 – Water pH in the floating in-Pond Raceway System (IPRS)

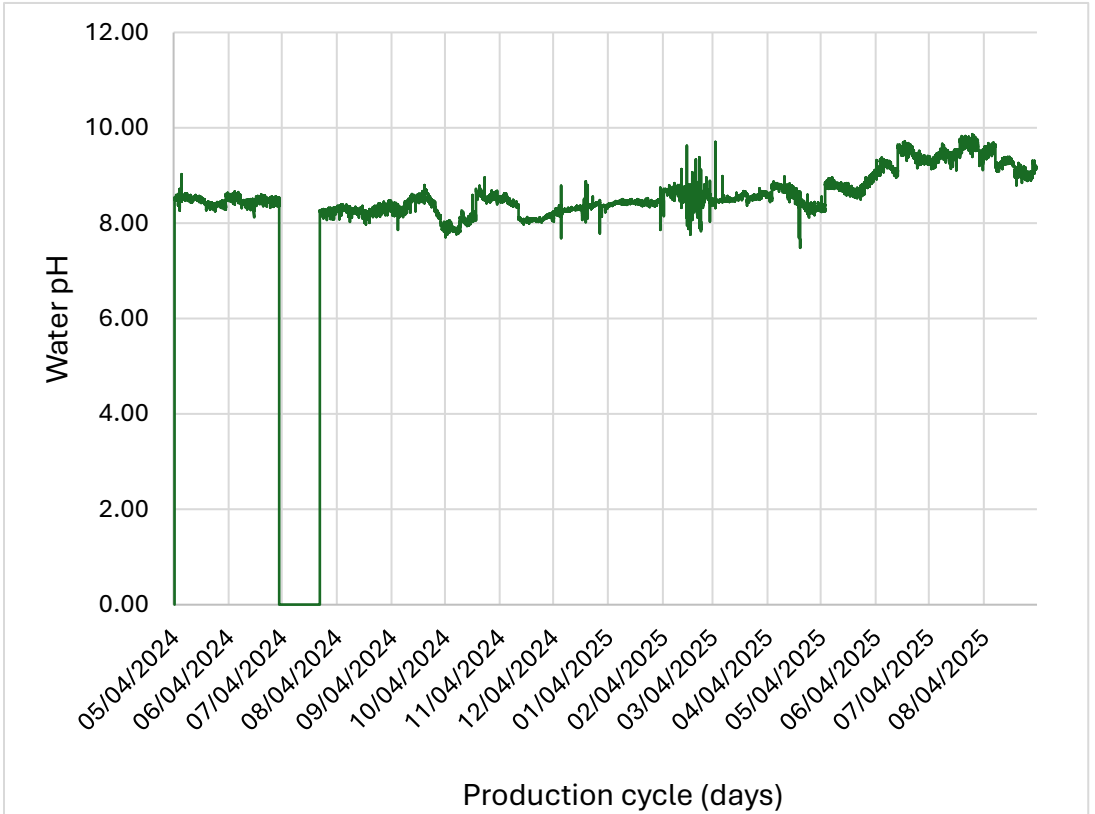


Figure 3 – Largemouth bass' daily feed (kg) and water temperature in floating IPRS

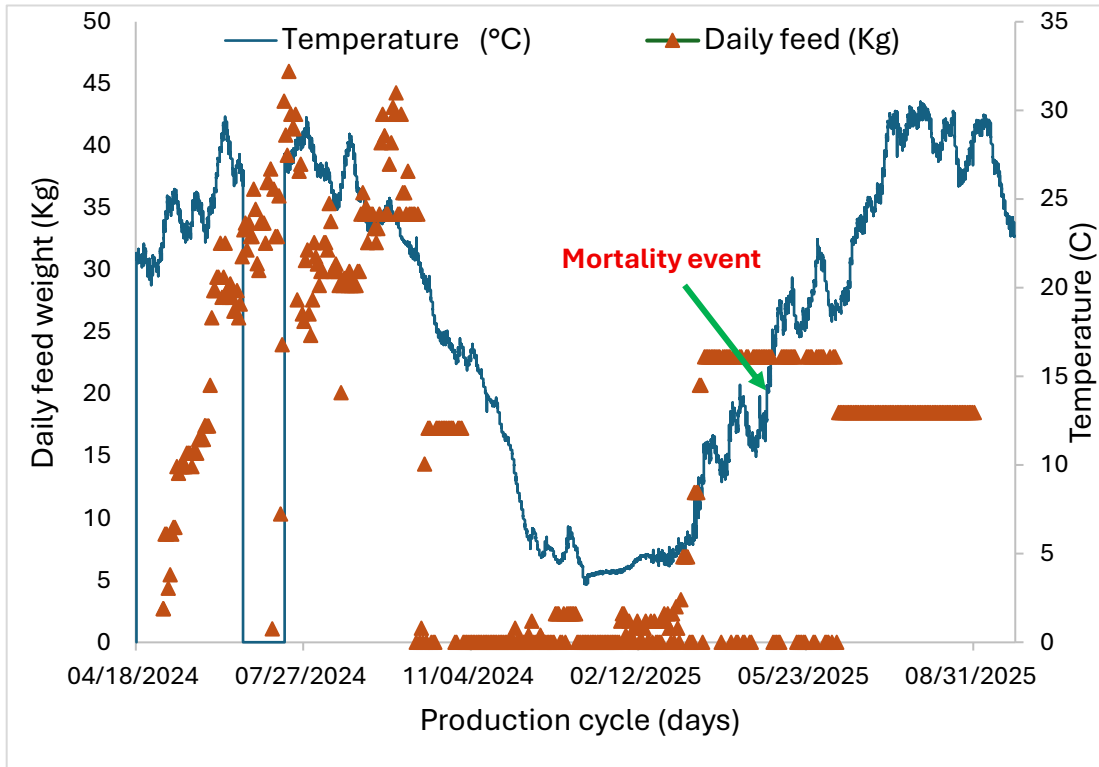
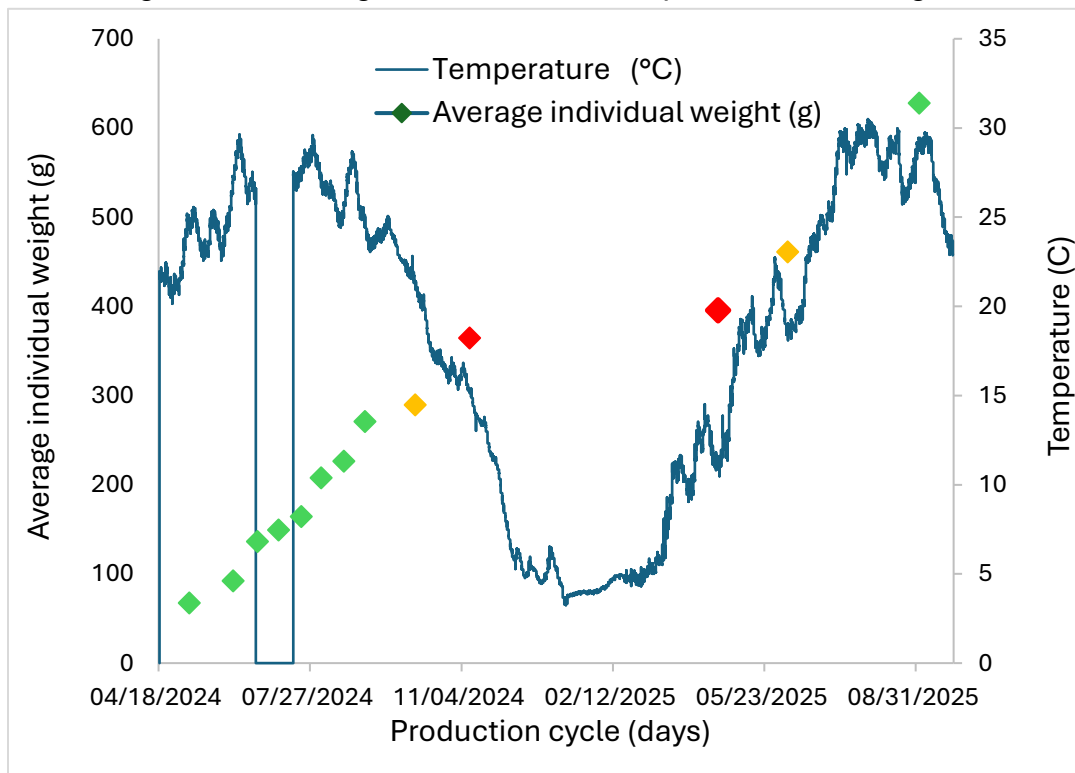


Figure 4 – Largemouth bass' growth and water temperature in floating IPRS



Summary:

The following table provide the monthly average water temperature and pH± standard deviation, the coefficient of variance (CV, %), and the maximum and minimum temperatures and pH for the floating In-Pond Raceway system.

Month	N	Temperature (oC)	pH
05 / 2024	662	22.72±1.50 (CV=6.60%)	8.47±0.09 (CV=1.06%)
06 / 2024	720	25.64±1.90 (CV=7.43%)	8.48±0.07 (CV=0.87%)
07 / 2024	194*	27.11±0.57 (CV=2.09%)	8.29±0.10 (CV=1.23%)
08 / 2024	744	27.02±1.27 (CV=4.69%)	8.27±0.07 (CV=0.80%)
09 / 2024	720	24.23±1.14 (CV=4.70%)	8.41±0.14 (CV=1.71%)
10 / 2024	744	18.90±2.23 (CV=11.79%)	8.19±0.29 (CV=3.54%)
11 / 2024	720	13.65±2.06 (CV=15.11%)	8.26±0.20 (CV=2.48%)
12 / 2024	744	5.74±1.04 (CV=18.15%)	8.30±0.10 (CV=1.23%)
01 / 2025	744	4.09±0.48 (CV=11.76%)	8.41±0.04 (CV=0.45%)
02 / 2025	672	4.74±0.27 (CV=5.77%)	8.60±0.22 (CV=2.59%)
03 / 2025	744	8.90±2.45 (CV=27.55%)	8.52±0.08 (CV=0.94%)
04 / 2025	720	14.34±2.86 (CV=19.92%)	8.57±0.21 (CV=2.43%)
05 / 2025	744	19.34±1.26 (CV=6.51%)	8.66±0.19 (CV=2.16%)
06 / 2025	720	25.15±2.88 (CV=11.46%)	9.30±0.22 (CV=2.33%)
07 / 2025	744	29.02±0.77 (CV=2.65%)	9.48±0.16 (CV=1.70%)
08 / 2025	744	27.10±1.78 (CV=6.55%)	9.26±0.20 (CV=2.17%)
Total	11,080	18.22±8.73 (CV=47.92%)	8.61±0.43 (CV=4.96%)
Maximum	11,080	30.49	9.87
Minimum	11,080	3.25	7.48

\*There were only 9-days that were monitored due to failure in the equipment.

#### Comments

- During Fall, fish reduced abruptly eating when temperature dropped below 20 °C.
- Fish maintained a low ratio during winter, basically maintaining their average weight.
- During Spring, fish started back to eat when temperature reached 14 °C.
- A mortality event related to human error occurred on April 19, 2025 (day 352) which accounted for an estimate of 4,780 fish, with an individual average weight of 396 g, for a total of 1,893 kg, that affected yield and FCR of the pilot study.

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